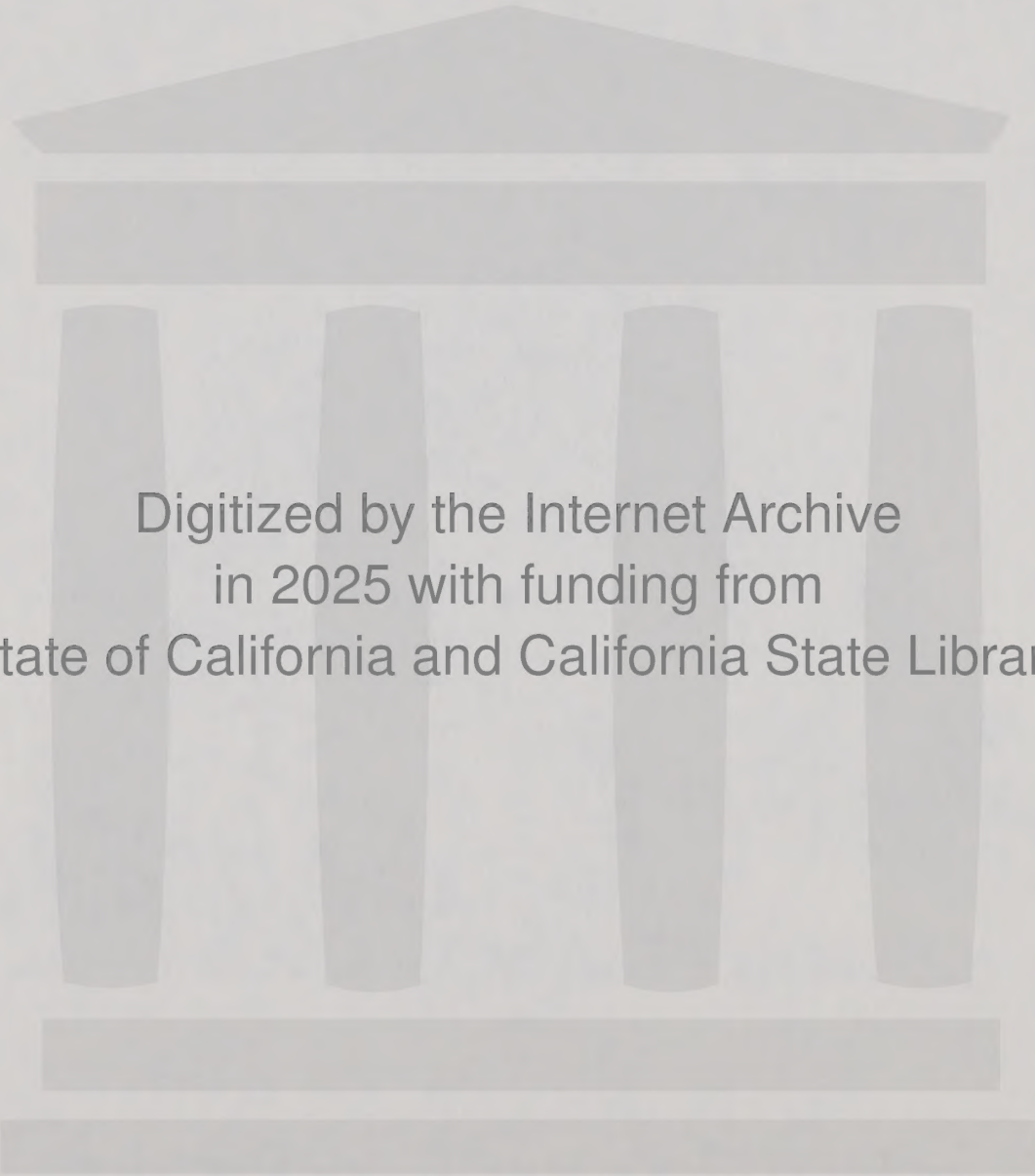


Draft Range Management Policies and Guidelines



East Bay Regional Park District



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Draft Range Management Policies and Guidelines

Overview

Introduction

Range Management Policies and Guidelines were developed cooperatively by East Bay Regional Park District staff and an eight-member Range Management Technical Advisory Committee. The RMTAC, composed of resource management professionals representing outside agencies, academia, environmentalists, and members of the ranching community, was appointed by the District's Board of Directors to assist staff in reviewing and developing management practices for park rangelands consistent with established resource policies set forth in the EBRPD Master Plan. These policies promote the conservation of parkland resources to maintain a healthy and balanced environment for the enjoyment and education of the public.

Purpose

This document provides general guidance to persons responsible for the administration and stewardship of park district rangelands to insure the proper use and enhancement of rangeland resources. The policies and guidelines apply modern resource management practices based on scientific principles supported by available research. This information also provides a framework upon which to base subsequent development of site-specific guidelines for each of the individual parks.

The District recognizes that research and monitoring will continue to improve standards and solutions to resource management issues on park rangelands. Biologists do not yet understand all of the natural and human-caused in-

fluences affecting the range environment. Much work is needed in this field, and resource management practices on the regional parks will incorporate new scientific information as it becomes available.

Description of Rangeland Resource

Range management is a land management discipline that applies an organized body of knowledge known as range science to renewable natural resource systems for two purposes: (1) protection, improvement, and continued welfare of the basic range resource, which may include soils, vegetation, and animals; and (2) optimum production of goods and services in combinations needed by humankind (Heady 1975). Range management is concerned with the conservation of lands that are maintained to produce water, forage, wildlife, timber, and recreational opportunities in such a way that other associated resource values remain unimpaired (Stoddart et al. 1975).

Rangeland types of the East Bay Regional Park District include open grassland, shrublands, oak savanna, and oak/hardwood woodlands. Grassland and tree-dominated communities are the most common rangeland vegetation types found throughout the District, and presently comprise about 53% and 41% of the total vegetative cover respectively. The remaining 6% of park rangelands are dominated by shrubland. The vegetation is a mixture of native and non-native species comprised of woody plants primarily of native origin, and native and non-native annual and perennial herbaceous plants.

Park District rangelands provide recreation, scenery and open space, as well as valuable habitat for plants and animals. Management of these diverse resources require conservation practices to enhance plant and animal diversity, minimize fire hazards, and maintain open, aesthetically pleasing landscapes.

General District Range Management Policy

The District's primary mission is to acquire, preserve, protect, develop, and operate regional parklands in perpetuity for public use, while conserving these lands to make the outdoor environment available for the enjoyment and education of the public. The goal of the District range management program is to conserve, manage, and enhance important resource values such as soil, vegetation, wildlife and water to ensure that parkland ecosystems are maintained in a healthy and productive condition.

Elements of the District Range Management Program

Vegetation Management

Rangeland vegetation management will conserve and enhance natural communities, promote the restoration of indigenous vegetation, preserve and protect populations of rare, threatened, endangered, and sensitive plant species and their habitats, reduce fire hazard conditions, and minimize brush encroachment. Management alternatives used to achieve these objectives will include livestock grazing, prescribed burning, mechanical treatment, integrated pest management, and/or protection.

Grazing Management

Livestock grazing is a resource management tool used to control vegetation and bring about vegetation change. The use of park land for livestock grazing contributes to the cultural and economic stability of family ranches and farms in Alameda and Contra Costa counties, thus encouraging the continued preservation of open space in the East Bay.

Scientific range management practices will be used to determine appropriate forage utilization levels and achieve desired range conditions on individual grazing units. Monitoring will be conducted to verify compliance with established standards for livestock use of park land, and to insure conformity to lease provisions. Livestock will be excluded from areas otherwise suitable for grazing when exclusion is dictated by the need to protect other resource values.

Site-specific unit management plans will be developed for all park rangelands. These plans will identify problems, prescribe actions to resolve conflicts with other resource and recreational uses, and provide recommendations for achieving more effective management of the units. The plans will be reviewed and updated periodically to incorporate new scientific information as it becomes available.

Conservation of Notable Areas

The District will identify, evaluate, and conserve notable areas such as archaeological sites, developed recreation areas, riparian and wetland communities, and habitats of rare, threatened, endangered, or sensitive species of plants and animals. The conservation of these areas will take precedence over all other uses, including livestock grazing.

Range Improvements

Range improvement practices (water development, fencing, herding, supplemental feeding, seeding, wetland protection) will facilitate improved livestock management and enhance other resource uses and values. Treatment methods and materials will be selected to suit site conditions. The need to conserve soil, plant, animal, water, and cultural resources will be considered during planning and implementation of range improvement projects.

Pest Management

Plant and animal pests will be controlled by utilizing Board-adopted integrated pest management (IPM) procedures and practices. A pest management site assessment will be completed annually to determine the extent of pest

infestations on individual management units and to provide a means for control.

Wildlife Management

The District will conserve and enhance wildlife populations and their habitats, and minimize conflicts and competition between wildlife and other uses, including livestock grazing. The District range manager and wildlife management specialist will work together with ap-

propriate public agencies and recognized wildlife management experts to alleviate adverse impacts to wildlife associated with range management practices.

Watershed Management

Rangelands will be managed to protect watershed values. Soil disturbances will be identified and corrected. Wetlands will be protected.

Vegetation Management

Introduction

This section includes a description of the vegetation resource and prescribes actions to be taken in response to vegetation management issues confronting the District. The objectives of rangeland vegetation management are to conserve and enhance natural communities, promote the restoration of indigenous vegetation, preserve populations of rare, threatened and endangered plant species and their habitats, reduce fire hazard conditions, and minimize brush encroachment.

Description of the Vegetation Resource

Grassland and Woodland Understory Vegetation

Native perennial grasses once comprised a significant portion of California's grassland and woodland environments. Extensive changes occurred in the composition of grassland and woodland understory vegetation as a result of the inadvertent introduction of non-native European plant species by early Spanish settlers. The interaction of many factors - unrestricted livestock grazing, prolonged drought, conversion of land to intensive agricultural production, urbanization, and fire suppression - paved the way for the widespread invasion of these exotic, annual plants (Burcham 1957, Heady 1977), which now occur extensively over the western two-thirds of the state. This

vegetation is referred to as the California annual grassland type.

Although pristine perennial grassland communities have been virtually eliminated in most places, numerous native, herbaceous broadleaf plants persist within the annual grassland type. Native grasses that remain occur in small, scattered stands and as isolated individuals (Barry 1972). Widespread restoration of the original cover does not appear possible (Bentley and Talbot 1948, Bartolome 1987).

Grassland and woodland understories support a diverse mixture of native and non-native annual and perennial plants. Common non-native grasses include wild oats *Avena fatua* and *A. barbata*, brome-grasses *Bromus mollis* and *B. diandrus*, annual ryegrass *Lolium multiflorum*, wild barley *Hordeum leporinum*, annual bluegrass *Poa annua*, quakinggrasses *Briza maxima* and *B. minor*, silver hairgrass *Airca caryophyllea*, and dogtail grass *Cynosurus echinatus*. Common introduced forbs include several species of filaree *Erodium* spp., bur clover *Medicago polymorpha*, cat's ear *Hypochoeris glabra*, English plantain *Plantago lanceolata*, and several others.

The non-natives, while generally representing ninety percent of the vegetative cover, comprise less than twenty percent of the total number of herbaceous plant species on park district rangelands (Legard and Budzinski 1988). Native grasses and forbs make up eighty percent of species diversity, and grow intermixed in varying proportions with the non-native flora. Most

common wildflowers, for example, are natives. These include brodiaeas *Brodiaea* spp., sanicles *Sanicula* spp., lupines *Lupinus* spp., clovers *Trifolium* spp., owl clovers *Orthocarpus* spp., mariposa lilies *Calochortus* spp., mule's ear *Wyethia* spp., yarrow *Achillea* spp., farewell to spring *Clarkia* spp., soap plant *Chlorogalum pomeridianum*, and numerous others. Native annual grasses of the genus *Vulpia* are also well represented. Plant composition can differ appreciably from one location to another (McNaughton 1968), depending on site characteristics, annual weather patterns, and the effects of past and current land use practices.

Native perennial grasses occupy grassland, brushland, and woodland communities in various concentrations up to about five percent of the herbaceous cover (Bentley and Talbot 1948). Some of the common perennial grasses include the once-dominant needlegrasses *Stipa pulchra* and *S. lepida*, wildryes *Elymus glaucus*, and *E. triticoides*, California oatgrass *Danthonia californica*, junegrass *Koeleria cristata*, melicgrasses *Melica californica* and *M. imperfecta*, pine bluegrass *Poa scabrella*, squirreltail grass *Sitanion hystrix* and *S. jubatum*, California fescue *Festuca californica*, meadow barley *Hordeum brachyantherum*, and California brome grass *Bromus carinatus*.

Woodland Vegetation

Woodlands exist in a mosaic with other plant communities. The vegetation consists of broad-leaved deciduous and evergreen trees, with an understory of grasses, forbs, and shrubs. Oak woodland tree species include blue oak *Quercus douglasii*, coast live oak *Q. agrifolia*, black oak *Q. kelloggii*, valley oak *Q. lobata*, Oregon oak *Q. garryana*, California buckeye *Aesculus californica*, and bay laurel *Umbellularia californica*. Canyon live oak *Q. chrysolepis*, and interior live oak *Q. wislizenii* occupy steep canyons and drainages.

Open-canopied blue oak woodlands tend to occur on the ridges, south aspects, and on less precipitous north-facing slopes, and are dominated by blue oak, with scattered occurrences of coast live oak, black oak, and California

buckeye. Isolated stands of Oregon oak are found in some locations. Valley oak is relatively rare.

Dense oak/bay woodlands generally occupy the steeper north- and northeast-facing aspects, canyon bottoms and associated side slopes. A mixture of oak species, and a proportionately large number of bay laurel, are characteristic of this type. The relative density of tree species varies considerably, as does the understory vegetation.

The composition and productivity of herbaceous vegetation in the woodland type is a result of topography, aspect, the density and height of the overstory canopy, the amount and duration of sunlight and shade, the accumulation of fallen leaves and needles, past and present woodland management practices, and fire history. The more open blue oak savannas support a vegetative cover similar to that of the annual grassland type. The vegetation of the denser woodlands may range from little more than a cover of plant litter to a well-developed understory of shrubs, herbs, ferns, and grasses.

Some native woodlands of the Bay Area have been replaced by an urban forest of introduced exotics, such as eucalyptus, pines, and cypress. Coniferous forest on park land is limited to a second growth stand of redwoods in the Oakland Hills. Infrequent scattered stands of oak/Coulter pine *Pinus coulteri* woodland occur on certain parks.

Shrubland Vegetation

Shrublands are stands of low-growing woody plants that occur intermixed with or bordering grasslands and woodlands. Some stands form impenetrable thickets where understory vegetation is practically eliminated; other intermediate stands support a highly productive understory. The primary value of this vegetation is in retarding erosion and providing watershed protection and wildlife habitat. Shrubland communities consist primarily of two types - chaparral and coastal scrub.

Chaparral occurs along ridges and dry slopes on shallow, rocky or gravelly soils. Plant associations within this type vary considerably and

include such plants as chamise *Adenostoma fasciculatum*, manzanita *Arctostaphylos* spp., wild lilac *Ceanothus* spp., and yerba santa *Eriodictyon californicum*.

The chaparral plant community is adapted to periodic fire (Shantz 1947, Naveh 1967). Many species sprout when cut or burned, and others reproduce only by seed. The seeds of some chaparral species cannot germinate until they have been exposed to the heat and soil conditions associated with fire.

Coastal scrub, generally regarded as a segment of the chaparral, is found at lower elevations within the coastal mountains. A large proportion of the plants are subshrubs characterized by such species as coyote brush *Baccharis pilularis* ssp. *consanguinea*, blackberry *Rubus* spp., bush monkeyflower *Diplacus aurantiacus*, poison oak *Rhus diversiloba*, black sage *Salvia mellifera*, California sagebrush *Artemisia californica*, cream bush *Holodiscus discolor*, and California coffeeberry *Rhamnus californica*.

Vegetative composition in shrublands fluctuates in relation to the fire cycle and to plant succession. In chaparral communities the shrubs occupy shallow, rocky, infertile soils and persist essentially unchanged through different successional stages. The coastal scrub community usually occurs where a vegetation cover in a more advanced stage of succession is being replaced by plants of an earlier successional stage as a result of some past disturbance (Sampson and Jespersen 1963). This community is found in settings ranging from semi-open associations of brush, grass or trees, to dense stands covering entire hillsides. Plant species of the coastal scrub type compete successfully against other vegetation because they have evolved adaptations that enable them to flourish and survive for long periods following fire or other disturbances.

Riparian and Other Wetland Vegetation

Riparian and other wetland habitats are areas of permanent standing or running water sustained by surface or subsurface water flows. The

vegetation of low grasses and grasslike plants, forbs, shrubs, and trees that distinguishes these communities from others varies markedly in structure and density. Riparian habitats on park rangelands occur primarily in scattered locations along minor, intermittent streams that produce high flows in winter and spring, particularly after heavy rains, and exhibit little or no flow during summer. Wetland areas include marshes, bogs, ponds, vernal pools, and small wet meadows associated with springs and seeps.

Riparian woodland occurs in a narrow band along streambanks and in steep canyons and ravines. Red and white alder *Alnus oregana* and *A. rhombifolia*, big-leaf maple *Acer macrophyllum*, western sycamore *Platanus racemosa*, cottonwoods *Populus fremontii* and *P. trichocarpa*, and various willows *Salix* spp. are generally present in locations where ground or surface water is accessible along the streamcourse. Streambanks in other areas support oaks, bays, and other trees representative of the surrounding woodland community.

Typical moisture-dependent herbaceous vegetation occurs in perennially wet locations along streams, within and around ponds and marshes, and in small, wet meadows associated with springs and seeps. Grasses and grasslike plants include rabbitsfoot grass *Polypogon monspeliensis*, salt grass *Distichlis spicata* var. *nana*, bentgrasses *Agrostis* spp., rushes *Juncus* spp., tules *Scirpus* spp., sedges *Carex* spp., horsetails *Equisetum* spp. and cattails *Typha* spp. Some common forbs are buttercups *Ranunculus* spp., watercress *Rorippa nasturtium-aquaticum*, stinging nettle *Urtica holosericea* and *U. urens*, brass-buttons *Cotula coronopifolia*, chain fern *Woodwardia fimbriata*, mints *Mentha* spp., duckweeds *Lemna* spp., and pondweeds *Potamogeton* spp.

Loss of riparian and wetland habitats in California has been attributed to many factors: stream channelization and stabilization, irrigation and flood control diversions, upstream impoundments, conversion to agricultural, residential, and industrial use, lowering of groundwater tables, overgrazing, and urbanization. Riparian

wetlands presently occupy only a small fraction of their previous range (Jones and Stokes 1987).

Rare, Threatened and Endangered Plants.

Several populations of rare, threatened and endangered plants occur on park district rangelands. Some of these species are endemic to the Bay Area, and others are more widespread in their occurrence (Munz and Keck 1959). Certain plants listed are uncommon enough to warrant continued monitoring, whereas some are considered to be rare throughout their limited ranges and vulnerable to further declines in their populations (Smith and Berg 1988). Few of these sensitive species are officially listed as rare, threatened, or endangered by the State of California or the Federal government. A list of rare, threatened and endangered plants known to occur on park land is provided in Appendix H.

Plant Pest Populations

The major plant pests recognized on park rangelands are artichoke thistle *Cynara cardunculus*, purple star thistle *Centaurea calcitrapa*, sweet fennel *Foeniculum vulgare*, and French and Scotch brooms *Cytisus monspessulanus* and *C. scoparius*. Selective weeding and herbicide use have, so far, been proven effective against these plants (Hillyard 1985, Havlik 1985, Amme 1985, Gizinski 1989). Other species may be recognized as pests under certain situations. Poison hemlock, pampas grass, milk thistle, bull thistle, yellow star thistle and eucalyptus are examples.

Vegetation Management Alternatives

There are several methods commonly used in managing vegetation: (1) fire, (2) mechanical, (3) chemical, and (4) biological. Each method has advantages and disadvantages that determine its suitability for particular situations (Bleier and Lindquist 1987). Each method has different impacts on the species that are to be controlled, and on the species which are to be

retained (Stoddart et al. 1975). Timing and intensity of application often have a profound effect on the results achieved by any vegetation management practice. Oftentimes it is best to combine two or more methods.

Fire

Prescribed burning uses fire to remove or reduce accumulations of vegetation. It is ecologically justified in vegetation types that have evolved with and are adapted to naturally occurring wildfires. Burning by prescription minimizes the risk of wildfire and air quality impacts (Bleier and Lindquist 1987). The need for on-site personnel, firefighting equipment, and construction of control lines required to conduct safe and effective prescribed burning and minimize the potential for escape is costly. There are potential liability problems associated with this practice, as well. Burning is generally less expensive than mechanical and chemical methods, and usually more practical for large, inaccessible areas, steep terrain, or dense brush stands. The use of fire is often most effective when used with other forms of control.

Mechanical

Mechanical methods utilize heavy machinery to crush, uproot, mow or disk woody and herbaceous vegetation. Mechanical treatments can be applied with fewer seasonal restrictions than prescribed burning and most herbicides. Mechanical methods, while effective, are time consuming, costly, inappropriate on steep terrain, and can cause soil disturbance, which greatly increases the potential for erosion (Bleier and Lindquist 1987).

Chemical

Chemical methods involve the use of herbicides to kill or suppress germination of vegetation. Chemical methods are labor intensive and require the use of expensive herbicides. Many chemicals must be applied during specific seasons, and have the potential to create off-site damage if transported from the site by water or wind (Bleier and Lindquist 1987). District policy seeks to eliminate the use of chemical

treatments and use alternative methods, whenever possible.

Biological

Biological methods fall into two basic categories. The first method involves the use of a host-specific biological agent, such as an insect or fungus, to achieve control of a target plant species. The use of this method is limited to achieving control of individual plants, and has no applicability for broader vegetation management purposes.

The second method involves the use of grazing animals to control plant growth and bring about vegetation change. Livestock used for this purpose must be carefully managed to minimize resource damage and prevent overuse. Grazing, because of its diversity of application, ease of use, low cost, availability, and efficacy of control is a popular method used to achieve vegetation management objectives.

Vegetation Management Policies

This section establishes vegetation management policies and guidelines for the various rangeland communities occurring on park land. Management issues are discussed briefly to provide a basis for understanding recommended actions. General policies have been established to describe how these actions will be carried out. As indicated earlier, site-specific vegetation management objectives will be developed for individual park units.

Management of Grassland and Woodland Understory Vegetation

Fire Hazard Reduction

Productive grassland and woodland understory sites dominated by annual herbaceous vegetation produce large amounts of biomass. Plant growth is prolific, and varies in response to weather and site factors. Vegetative production on the more fertile sites is as much as 2-3 tons of dry matter per acre per year. Annual plants do not survive from one year to the next and their life cycle is completed by late spring or

early summer. Remnant plant material left standing during the summer months poses an extreme fire hazard.

Fire hazards can be reduced in grassland and woodland understory vegetation by creating extensive fuelbreaks, which must be maintained annually. Where steep terrain limits the use of mechanical equipment, expensive hand clearing is often necessary. Other methods involve reducing fuel accumulations over large areas by grazing or prescribed burning.

Policy: The District will employ environmentally acceptable, economically feasible, methods to maintain fuels at acceptable levels. Management options will include the use of livestock grazing, mowing, disking, hand-clearing, and prescribed burning. Treated areas will act as firebreaks where natural fuels are modified to create small, discontinuous units as an aid in confining fires.

Plant Diversity

Productive grassland and woodland understory sites dominated by annual herbaceous vegetation can accumulate large amounts of thatch over time. Unmanaged areas are characterized by dense annual grass growth and thick litter accumulations. This plant material acts much like the mulch used to suppress unwanted plants in a garden. The buildup of successive layers of dead plant material diminishes native herbaceous plant growth and may lead to the spread of undesirable weeds (Talbot et al. 1939, Biswell 1956). This effect is apparent on several regional parks where fire or livestock grazing has not occurred for many years.

A diversity of native herbaceous plants on annual grasslands can be maintained and enhanced by reducing residue accumulations from non-native grasses and forbs (Talbot et al. 1939, Heady 1956, Bartolome et al. 1980, Menke and Langstroth 1987, Parker 1989). Management to maintain and increase native perennial grass populations requires treatment methods that involve mowing, burning and/or grazing practices to reduce competition from the more aggressive, non-native annual plants (Bentley and Talbot 1948, Daubenmire 1968, Parker 1989). Protection must also be provided to native

perennial grasses during critical growth stages (Menke et al. 1990) to maintain plant vigor. The negative effect of high residue levels on native plant composition is negligible in areas where non-native annual plant production is sparse, such as on shallow, rocky soils and in dense woodlands (Biswell 1956).

Policy: Vegetation will be managed to achieve species diversity and maintain a high representation of native plants. Management options will include the use of livestock grazing, mechanical treatment, prescribed burning, integrated pest management, protection, and other proven methods and practices to meet these objectives. Areas where native perennial grasses comprise a substantial part of overall plant composition will be managed to provide for the maintenance and enhancement of these populations.

Rangeland Seeding

The primary purpose of seeding on park rangelands is to establish plant cover for the protection of bare or disturbed soil. An adequate vegetative cover helps minimize soil erosion, increases water infiltration, permeability and storage of soil moisture, and reduces soil surface evaporation. Invasion of undesirable plant species and weed pests can be discouraged by providing an adequate cover of vegetation.

Policy: Management of park rangelands will be conducted to maintain and enhance the existing natural vegetation. Range seeding will be used primarily to rehabilitate disturbed ground and minimize erosion. Seeding to enhance plant production and to increase the cover of palatable and nutritious forage species is not a management objective. Recovery of rangelands under grazing management and in poor condition will be achieved by improving livestock distribution, introducing alternate grazing systems, or reducing stocking.

Areas proposed for treatment will be appraised individually to determine the appropriate reseeding methods to be used. Native and naturalized annual species adapted to the conditions of the site will be utilized. Species representative of the surrounding natural vegetation will be preferred. Severely disturbed

sites with a potential for serious erosion will be stabilized as rapidly as possible by establishing an herbaceous plant cover.

All seeding will take place in the proper season. Timing is critical to insure that adequate soil moisture is available to ensure plant germination and survival. Livestock use may be deferred to promote plant establishment.

Native Grassland Restoration

Research to date indicates that native perennial grasses do not establish well on most annual grassland sites without extensive site preparation (McClaran 1981, Fossum 1990). Successful re-introduction of native perennial grasses into annual grassland requires the use of cultivation methods, and must be followed up by grazing or other treatments to reduce competition from the more aggressive resident annuals (Heady 1956).

The use of native grasses alone to provide erosion protection on disturbed sites has been demonstrated to be largely ineffective. In one particular study, seeding at a rate of 32 pounds per acre with purple needlegrass *Stipa pulchra* resulted in only one plant per seven square feet (McClaran 1981). Naturalized annual grasses are better suited for erosion control because they germinate readily and provide more rapid and complete soil protection. The establishment of scattered native grass plants, however, may be desirable as a first step in achieving grassland restoration objectives.

Continuing investigations are necessary to determine successful methods for reintroducing and maintaining extensive populations of native perennial grasses in the wild. More reliable techniques for establishing native grasses and forbs, reducing competition from naturalized annual species, and creating a more favorable environment for native plants must be developed to encourage the return of the native bunchgrass component of the California prairie ecosystem.

Policy: The District shall designate appropriate areas for restoring or reclaiming lost or altered natural biotic communities (EBRPD Master Plan 1989). Circumstances will determine the

suitability of using native plant materials in restoration efforts.

Native perennial grasses can be seeded in areas where the need to provide immediate soil protection following disturbance is minimal, such as on flat sites having low erosion potential. Seed mixes containing a combination of naturalized annual and native perennial grasses can be used to establish scattered plants on steeper sites. Re-introduction of native grasses and forbs into annual grassland areas may be accomplished using grass plugs or containerized stock.

Follow-up treatments such as livestock grazing, burning, or mowing will be necessary to maintain these plants over time.

Management of Woodland Vegetation

Oak Management

Many oak woodland communities in California are experiencing a low rate of natural regeneration (Muick and Bartolome 1987). Certain sites support an abundant supply of oak seedlings and saplings, whereas stands in other areas consist entirely of mature trees. The reasons for this phenomenon are not fully known.

Investigations have indicated that a number of influences may be responsible. Acorn consumption, browsing, and root damage caused by deer, cattle, rabbits, rodents, and defoliating insects are factors inhibiting seedling growth and establishment (Griffin 1971, 1980, McClaran 1986). Changes in the herbaceous plant cover over the past 200 years, fire suppression efforts, and exploitive land-use practices may have created an environment that is no longer hospitable to seedling growth (Twisselman 1967, Griffin 1971, Anderson and Pasquinelli 1984). Areas that exhibit poor oak regeneration could eventually revert to another type of vegetative cover as existing stand densities of trees decline.

Fire has been found to have a positive role in tree establishment (McClaran 1986, Mensing 1988), and selective thinning may be necessary to encourage regeneration by sprouting and to

maintain healthy stands. The artificial propagation of oaks through the planting of acorns and seedlings has been successful under certain conditions (McCreary 1989).

Policy: Management of woodland overstory vegetation will be geared toward maintaining a mix of age and size classes to provide structural diversity and sustain production and recruitment of tree species. Where such action is necessary, prescribed burning, thinning of forest stands, protection of oak seedlings, and planting of acorns and seedlings from local genetic stock may be used to encourage stand regeneration.

Plant Diversity

Changes in the character, species, and density of woodlands affect other values and resources. As woodland regeneration develops and the tree crowns occupy more space, the understory vegetation changes in species and quantity. Unless controlled, these trees develop into a dense overstory that shades out understory growth. The quantity of understory vegetation is inversely related to overstory density (Pase 1958, Blair 1969).

The greatest diversity of wildlife species occurs in woodlands with a variety of tree species, brush, forbs, and numerous openings. To provide stable habitat, there must be a proper mix of all stages of stand development (McGuinness 1969). Scattered openings in the stand comprising approximately 5 to 10 acres can also contribute to improved wildlife habitat conditions (McCaffery and Creed 1969).

Policy: Forest management practices may be necessary to encourage secondary successional changes to occur that enhance vegetation and wildlife diversity. The removal of forest vegetation mechanically or by fire to modify the tree canopy and influence the composition of the undergrowth may be necessary to maintain optimum biodiversity.

Fire Hazard Reduction

In California, the long, hot, rainless summers dry the vegetation and make it highly flammable, with the result that fire starts easily and burns very rapidly. When natural fires are sup-

pressed for many years the understory often accumulates debris and thick undergrowth that acts as a fuel source in the event of a wildfire. A more intense fire usually results under these conditions, and not only destroys mature trees, but also kills small seedlings and young saplings. Large trees that remain may be weakened, leaving them less resistant to insects and disease. Uncontrolled fire can also burn the blanket of plant residue on the forest floor, which is important in conserving water and preventing erosion. Repeated fires turn valuable forests into brushlands and may adversely affect wildlife populations.

Policy: Trees may be thinned or removed, as appropriate, to minimize fire hazard conditions. Certain situations will require reducing or eliminating understory fuels and breaking up the continuity of vertical fuels between ground level and the crowns of trees. Different treatment methods will be applicable for different situations, and will include the use of livestock grazing, prescribed burning, chemical treatment, and mechanical removal. The construction of access roads, firebreaks or fuelbreaks may be necessary to improve firefighter response time and provide effective fire containment.

Management of Shrubland Vegetation

Shrub Invasion

The encroachment of coastal scrub vegetation into grasslands was discouraged in the past by the interaction of recurring fire and intensive browsing by native and introduced animals that fed on shrub regeneration and inhibited seedling growth. Successful suppression of fire during this century and the elimination of grazing has contributed, in many instances, to the expansion of coyote brush, poison oak, and other invasive shrubs into areas formerly occupied by grassland (McBride and Heady 1968, McBride 1974). Continued livestock grazing has been effective in minimizing the incursion of coastal scrub vegetation into grasslands of the East Bay.

Where coastal scrub occurs on north- and east-facing aspects, there appears to be a prolonged cyclic succession from grass to shrubs to mixed forest to woodland, barring any further disturbance (McBride 1974). Dense coastal scrub vegetation tends to remain indefinitely on south- and west-facing slopes and in valley bottoms.

The proliferation of shrubs on park land diminishes recreational and aesthetic values by limiting public access and modifying existing vegetative landscape features. The intrusion of poison oak into grasslands is an additional concern in a parkland recreational setting because it poses a health hazard. Contact with the plant can cause mild to serious skin irritations in many individuals. Lack of knowledge in recognizing poison oak and the fact that the irritant substance can be transmitted by pets or on clothes contributes greatly to the problem.

The incidence of ticks generally is greater in brushy areas and along trails bordered by dense shrubs where encounters with branches often are unavoidable. The fact that some tick species harbor the agents that cause Lyme disease, and other illnesses, which can be transmitted to humans, is a cause of increasing concern.

Policy: The District considers the widespread encroachment of coastal scrub vegetation - particularly the more monotypic stands of coyote brush and poison oak - an undesirable phenomenon. The extensive occurrence of coastal scrub vegetation in the East Bay, and its potential for readily infiltrating park grasslands in the absence of management, makes most treatment methods, other than livestock grazing, impractical on a large-scale basis. Mechanical methods, prescribed burning, and chemical treatments will be used in appropriate situations.

Fire Hazard Reduction

Mature shrub stands protected from fire for a number of decades present a greater fire hazard than would occur under a more regular periodic burning regime. Shrublands become exceedingly dense and decadent over time, diminishing species diversity, reducing food and cover for wildlife, and increasing the risk of

catastrophic wildfire, which could severely impact other natural resources. Fire danger is intensified where these fuels occur near residential development, expanding the possibility that a fire originating on park land will reach adjacent private properties.

Policy: Prescribed burning and mechanical treatment will be used to maintain vegetative conditions that are of low flammability and fuel volume, where appropriate. Fuelbreak construction may be necessary in high risk areas. Coordination with local fire districts will be required to assess fire hazard conditions in areas supporting dense shrub growth. Consultations with biologists will be conducted prior to project implementation to evaluate resource impacts. Projects will be designed to create stands of discontinuous, naturally appearing clumps or islands of younger age class brushy vegetation. Follow-up mechanical, chemical, or grazing treatments will often be required to control brush regeneration and maintain desired conditions.

Management of Riparian and Other Wetland Vegetation

General Importance

Riparian and other wetland communities occur in stark contrast with the surrounding drier grasslands, woodlands and shrublands. They contribute to the development of edge - transition zones where plant communities or structural conditions within plant communities converge (Thomas et.al. 1979). Areas occurring along this juncture (ecotone) are rich in wildlife (Patton 1975), because there is a mingling of species common to each vegetation type, and the addition of other species that are often products of the ecotone itself (Southwood 1972). Riparian vegetation along stream corridors binds the soil, removes sediment from runoff, and dissipates the energy of flood waters.

Policy: Riparian and other wetland environments will be managed to preserve and enhance the natural and beneficial values of these areas and prevent the destruction, loss, or degradation of habitat. Creeks, streams, and other wetlands

shall be retained in their natural state, whenever possible, to maintain water quality, biotic diversity, aesthetic values, and recreational opportunities. Direct and indirect disruptive influences on riparian and other wetland communities will be eliminated or controlled.

Riparian and other wetland areas exhibiting signs of disturbance will be restored to original conditions. Revegetation of these sites will be accomplished using native species compatible with associated vegetation. Management programs will be developed and implemented to inventory, classify, and monitor riparian and other wetland environments and to identify those areas warranting preservation and enhancement.

Action will be taken to protect riparian and other wetland resources in areas where livestock grazing occurs. Delayed grazing to defer livestock use of riparian and other wetland areas during critical periods may be adequate in some situations; other circumstances will warrant the elimination of livestock use altogether. Site-specific unit management plans will prescribe appropriate actions to prevent adverse impacts.

Seeps, Springs, and Wet Areas

The importance of the intermittent creeks, seeps, springs, and water impoundments in supporting wildlife and wetland vegetation is especially evident given the nature of the hot, dry, rainless summers characteristic of the region. These water sources increase the value of the surrounding area as habitat for wildlife, and represent an essential habitat element in themselves for plant and animal species that require free water or a wetland environment for all or part of their life stages.

Policy: Exclosures will be constructed to protect wetland areas associated with springs and seeps on parks where livestock grazing occurs. Where natural water sources have been developed for livestock use, water storage facilities will be located on dry ground outside of the exclosures. Troughs will be designed to accommodate wildlife use. Overflow water from livestock troughs may be used to create and maintain additional small, protected wetlands. Gravity flow pipeline systems will be installed,

as needed, to transport water from isolated spring and pool areas along dry creeks to storage sites for livestock outside of the riparian area. Protection of spring-fed ponds will be encouraged when arrangements can be made to provide alternate drinking water outside of or near the enclosed area.

Management of Rare, Threatened, Endangered and Sensitive Plants

Plants become rare, threatened, and endangered because of changing conditions brought upon by natural processes or through human activities, particularly the destruction of habitats or through the elimination of individual plants. Some plants found on park land may be endemic in small geographical areas or in highly specialized habitats, or may be relict species that show little variability and are on the verge of extinction. Others occur in the pioneer or early stages of ecological succession and exist under transitory conditions.

Protection of plant habitats may be insufficient for the preservation of some populations of rare, threatened, endangered and sensitive species. Attempts to protect individual plants by fencing, for example, without consideration of the conditions upon which they depend, may not be effective.

Policy: The District will protect and maintain the habitats and populations of rare, threatened, endangered, and sensitive plant species (EBRPD Master Plan 1989). All potential direct, indirect, and cumulative impacts upon these species and their habitats will be assessed, and conservation measures will be developed on a site-specific basis.

Scientifically oriented research will provide guidance for determining appropriate management for these species and their habitats. Management programs based on this research will be planned and carried out to maintain, perpetuate, increase, or restore population levels and viability. Populations of listed species will be monitored. Periodic observations of population size, condition of habitats, reproduction, viability, and changes in geographical distribution will be recorded.

Wildlife Considerations

Plant communities are characterized by constant change, which is represented as a series of stages, or successions (Oosting 1950). The pattern of change is cyclic and occurs in reaction to climate, fire, and other natural disturbances. As the plant community changes, so does the animal community. Our native wildlife species evolved with these plant communities, and developed preferences for various successional stages. Some species are adapted only to certain habitat conditions, without which they disappear from the local fauna.

The use of rangelands by terrestrial vertebrate wildlife species is mostly dependent on the structure of the vegetative cover (Cooperrider et al. 1986). Some level of vegetation management often is necessary to maintain the health and diversity of habitats and their associated wildlife species. Research indicates that wildlife habitat can be optimized by maintaining plant communities in a variety of successional stages (Komarek 1989, Quinn 1982). Livestock grazing and prescribed burning, for example, are widely used as management tools to benefit wildlife populations by altering the structure and composition of the plant community.

Policy: Appropriate range management practices will be used to enhance habitat conditions favorable to a wide variety of native wildlife species. The District Wildlife Biologist will coordinate with the District Range Manager and other resource management specialists in the preparation and implementation of site-specific wildlife management prescriptions for individual management units. These prescriptions will be designed to promote greater species diversity and improve habitat quality.

Pest Management

District integrated pest management policy includes a process to assess the need for pest suppression activities and to determine strategies necessary to achieve control in situations where pests present unacceptable safety, health, economic, and environmental problems, or cause functional damage.

Presently, plant pest populations on certain parks are being studied and documented for rates of expansion or decline. Test plots have been established to measure the effectiveness of various chemical and non-chemical methods for controlling undesirable plants. Ongoing evaluations and research, along with examination of methods used in other areas, will continue to yield satisfactory solutions to pest problems.

Policy: Integrated pest management methods will be used to control the introduction and spread of undesirable plants. A full range of alternative treatments, including prescribed burning, mechanical, biological, and chemical methods will be considered for use in the control of rangeland plant pests. The evaluation and control of plant pest problems shall be performed in accordance with EBRPD pest management policies and practices, and ap-

plicable state and county regulations. Long-term management of park rangelands will consist of fostering beneficial vegetation and suppressing undesirable plant species by maintaining environmental conditions favorable to the preferred vegetation and least favorable to the plant pest.

Many insects and diseases threaten the well-being of plant communities. Methods of protecting vegetation against these depredations will include removal of infested or infected material, maintenance of the general health of plant communities, and judicious use of pesticides. Where infestations are epidemic, pesticides may offer the most feasible short-term method of preventing loss of the resource despite the possible adverse environmental and social implications. In the longer term, integrated pest management will provide other alternatives.

Fire Management

Introduction

The vegetative landscape in the Bay Area is a dynamic system which developed under the influence of fire over millions of years. Fire is a natural force that appears in the natural cycle of ecological succession. Many plants and animals have adapted to and depend on recurring fire. Native Americans of the region periodically set fires to encourage the growth of food plants, fell trees, drive game, and attract game to recent burns (Williams 1892, Simpson 1961).

Following European settlement, the intentional use of fire was confined to farms and ranches and declined elsewhere. The continuing urbanization of rural areas and the desire to preserve the region's valuable natural and scenic resources caused large expanses of land to be protected from fire for decades. The resulting accumulated growth of vegetation in many areas necessitated the practice of prescribed burning to reduce fuels, stimulate

fire-adapted plant communities, and improve wildlife habitat.

Prescribed Burning

Prescribed burning, or the intentional ignition of grass, shrub, and forest fuels for specific purposes, has long been a recognized land management practice. Prescribed burns are confined to specific areas, regulated in intensity, and otherwise controlled to achieve desired results. The reasons for burning are varied. Fire may be used to manage specific vegetation types, reduce fuel accumulations, and enhance wildlife habitat, among other objectives.

Policy: Prescribed burning will be conducted where it is necessary to meet fire and resource management objectives. Treatment areas will be designated, and detailed strategies for carrying out burns will be prepared on a project by project basis.

Coordination will occur with appropriate fire management and regulatory agencies to assure conformance with all procedural requirements.

The District will seek the advice of professional biologists to assess potential resource impacts associated with project implementation.

Fire Prevention and Suppression

Park land and adjacent residential communities form part of the urban-wildland interface, an area with a substantial potential for catastrophic fire. Topography, climate, vegetation, and patterns of land use and ownership all contribute to a situation where an imminent risk of fire often exists. Areas that a few years ago would have caused little concern if threatened by fire now contain neighborhoods and isolated homes. Parks with slopes that lead uphill to private property and areas with heavy fuel loading present the greatest hazards.

The District is bound by state, county, and local fire hazard abatement laws and ordinances. The California Department of Forestry and Fire

Protection (CDF) requires fuel reduction where there is a wildfire hazard to adjacent rangeland or forestland. The park district also has a legal obligation to minimize fire danger in areas where residential and urban development occurs in association with naturally vegetated park land. *Sprecher vs. Adamson* (1981) 30 Cal 3d.. 359 specified that a land owner (or possessor) may be held liable in negligence for allowing hazardous conditions to exist on one's land, and that harm caused to another by want of ordinary care in the management of one's property may lead to the question of whether the landowner acted in a reasonable manner.

Policy: The District will abide by all EBRPD fire safety standards. Vegetation will be modified on selected areas in strategic locations to break up expanses of natural fuels as an aid in the control of fires. A fire management plan will be developed for all District parks.

Grazing Management

Introduction

This section provides specific mitigation and monitoring practices that will be used by the District to regulate livestock grazing on park land. Policies and guidelines are defined to determine livestock carrying capacities, establish acceptable forage utilization levels, monitor the degree of grazing use, incorporate alternative grazing strategies where appropriate, install range improvements, and afford protection to other resources on park land.

Description of the Annual Grassland Type

The foothill ranges of California are dominated by non-native, introduced annual grasses and forbs. As a result, they are managed differently than perennial rangelands throughout other parts of the western U.S. Annual plants do not survive from one year to the next and reproduce

only by seed, whereas perennial plants are long-lived and reproduce both vegetatively and by seed.

Annual plants are well-adapted to California's Mediterranean climate, and are more resistant to grazing than most native perennials. While it is necessary to allow plant material to remain following harvesting of either annual or perennial plants, the reasons for doing so differ. Perennial range is managed to leave a portion of the herbage to safeguard storage of plant reserves, whereas annual range is managed to allow old vegetative growth to remain on the ground following grazing to promote soil protection, nutrient recycling, and seed germination.

Plant growth on annual rangeland is highly dependent upon and responsive to weather conditions. Plant species composition and vegetative production fluctuate drastically from year to year in response to temperature differences and the timing and amount of precipitation during

the growing season (Bartolome 1987). Some adjustments in stocking are usually necessary every year to obtain efficient utilization of the vegetation.

Plant growth begins with the arrival of rain and the emergence of new seedlings in the fall. The emergent vegetation continues to develop slowly throughout the cool, wet winter months. Rapid spring growth occurs in response to rising temperatures and lengthening days. Plant production during this period exceeds the rate at which livestock are able to consume the vegetation under moderate use levels. A majority of the plants reach maturity and die by mid-spring as soil moisture is depleted. Remnant plant material is left standing during the hot, dry summer months.

Good management of annual rangelands is determined by the amount of residual dry matter, or mulch, that remains on the ground at the end of the grazing season (Jasmer and Holechek 1984). Mulch provides watershed protection, promotes nutrient recycling, prevents high soil surface temperatures, improves the soil as a habitat for organisms, retards evaporation, increases water infiltration and creates favorable conditions for new plant growth (Hopkins 1954). Many resource management objectives can be met solely by managing for residual mulch.

Other range practices that facilitate improved management on annual rangelands involve the installation of range improvements and/or the use of alternate grazing systems to influence or control the movement of livestock, encourage more uniform distribution of grazing, and maintain range productivity.

Monitoring and Evaluation Standards

Range Forage Utilization

Research indicates that the amount of mulch remaining in any one year can influence plant productivity and plant composition the following growing season. Low amounts of mulch tend to favor the growth of undesirable plants (Heady 1956, Hooper and Heady 1970). An

optimum mixture of desirable plant species results on annual range where 600 to 800 pounds per acre are left, and little is to be gained from a vegetation production standpoint if more mulch remains (Pitt and Heady 1978, Bartolome et al. 1980). Too much mulch results in a thatch, which inhibits new plant growth (Clawson and McDougald 1982).

Policy: Livestock forage utilization will be regulated to assure that appropriate amounts of residual dry matter, or mulch, remain on the ground to achieve desired resource management objectives. Various residual mulch guidelines exist for different sites in the California annual grassland type (Clawson and McDougald 1982, U.S. Forest Service 1983). EBRPD guidelines will meet or exceed other established standards. The following information is a guide to the minimum amount of mulch that must remain on the ground at the end of the grazing season:

- for 0 to 30% slope: leave 600 lbs./acre
- for 30 to 50% slope: leave 800 lbs./acre
- for > 50% slope: leave 1000 lbs./acre

Individual grazing units may have special circumstances that will require that additional mulch remain. Residue requirements will vary according to the need to promote soil stability, maintain plant productivity, enhance visual and recreational values, or protect wildlife habitat.

Range Analysis

Several methods are available for estimating stocking rate on annual rangelands in California. Most approaches used to approximate livestock carrying capacities on annual rangeland involve conducting a subjective appraisal of a unit's soils, topography, vegetative features, and water availability. A review of historic and current grazing levels can also provide an indication of the amount of use a given area can sustain.

Policy: Authorized levels of livestock use will be established for all areas of park land under grazing management. A "range analysis" process will be utilized by the District to provide a reasonably accurate estimate of the number of

livestock an area can be expected to support in an average, favorable, and unfavorable rainfall year. Range analysis will be conducted on all park lands under grazing management to establish authorized use levels that are not to be exceeded in any given year.

These stocking rates will serve as benchmarks from which necessary adjustments in livestock numbers can be made in response to annual variations in forage production. The manager will periodically inspect the range during the grazing season to determine if grazing use needs to be adjusted to insure that desired amounts of mulch remain. The range analysis procedure is outlined in Appendix G.

Range Monitoring

The purpose of range monitoring is to verify compliance to established standards for livestock use of park land and to insure conformity to lease provisions. Inspections are conducted to document use levels and trends, monitor range conditions, and collect information and data that can be used to contribute to improved management.

Policy: Livestock forage utilization on park rangelands will be monitored using appropriate measurements to determine use levels and assess resource impacts. These are:

Clipping and Weighing

Clipping and weighing vegetation from small sample plots will be used to forecast forage production and estimate residual mulch levels. The usual technique involves clipping representative vegetation from a designated location, drying and weighing the samples, and recording the biomass on a weight per unit area basis in pounds per acre or kilograms per hectare (Clawson and Menke 1981). Circular plots, 0.96 square feet in area will be used, because forage weight in grams times 100 is equal to pounds per acre. Overall forage utilization will be determined by gathering data from several representative sample areas, and extrapolating the results to the entire grazing unit upon which the data is taken.

Photo Index

Utilization photo indexes will be used to illustrate how an area appears when residual mulch is at a given level. The photographs will consist of one close-up ground photo and one panoramic photo showing minimum mulch levels established by the District. Copies of the photographs will be provided to all appropriate EBRPD personnel and grazing tenants as a simple guide for determining appropriate levels of forage utilization on the grazing units.

Key areas

Evaluation of forage utilization will be conducted on key areas within the grazing unit. A key area is a portion of a rangeland selected as a representative site on which to monitor the effects of grazing use, the principle being that no range of appreciable size can be uniformly utilized. Heavier use is inevitable around watering holes, salt grounds, driveways, level valley floors, and more accessible ridgetops (Stoddart, Smith and Box 1975).

Moreover, some of the private properties acquired by the park district are obtained in poor condition, and the terracing, gullying, and presence of agricultural pests that may remain as a legacy of past land use practices (overgrazing, farming, clearing, road building) cannot be used to accurately gauge current management.

Key areas will be identified that reflect the overall effects of current grazing management practices on the given range unit. Utilization maps that document the degree and distribution of grazing use on the various units will be compiled to help identify key areas for monitoring. Grazing unit inspections will be conducted periodically to determine when utilization levels are approaching the desired mulch levels. When the average of all key areas indicates that established use standards have been or will soon be reached, livestock will be moved to lesser utilized pastures or will be removed from the units.

Unit Management Plan

A unit management plan is a program of action designed to secure the best practical use of rangeland resources. Management plans identify prescriptions and practices necessary to manage rangelands for livestock grazing in conjunction with other resource and recreational uses.

Policy: Site-specific guidelines will be developed for each park where livestock grazing occurs. Unit management plans will incorporate a strategy for the management of individual grazing units consistent with associated resource management and land use development plans. The unit management plans will include a narrative evaluation of inventory data, identify major resource issues and concerns, and clarify the direction and priorities for management of the units. Specific measures necessary to solve related problems, minimize conflicts with other uses, and achieve desired management goals and objectives will be identified for implementation. The plans will be reviewed and updated periodically.

Facilitative Management Practices

Grazing Systems

A grazing system is a plan or schedule for grazing livestock on one or more pastures for designated periods of time. This practice allows the land alternate periods of grazing and rest. Distinction among the various types of grazing systems is based upon the sequence and timing of the grazing and rest periods within pasture divisions over the course of one to several grazing seasons.

Policy: Alternative grazing systems will be used in situations when continuous grazing alone does not fully achieve vegetation management objectives. The development of an appropriate grazing system will be governed primarily by the potential for range improvement. The investment of implementing such a practice must guarantee a return in the form of improved livestock management, better range

utilization, or increased vegetation enhancement. Circumstances in which grazing systems may be used include, but are not limited to:

- reducing demonstrated conflicts among livestock, wildlife, and other environmental values.
- manipulating plant species composition by varying season, frequency and intensity of grazing.
- maintaining or enhancing native plant populations.
- providing protection, if warranted, to areas requiring special protection, e.g. riparian zones, rare plant populations, recreational sites, etc.
- controlling or reducing agricultural pests.

Implementation of grazing systems may require new fencing, additional watering facilities, or different stocking densities and grazing pressures. Associated lands owned or leased by a tenant may be included to form logical management units, or to provide additional pastures onto which livestock can be rotated.

Range Improvement

Range improvements are any developments or treatments undertaken for the purpose of improving the range resource or facilitating livestock management. Range improvements such as water development, wetland exclusions, fencing, salting, supplemental feeding, fertilizing, seeding, stock trail construction and herding are practices that are used to control or influence the movement of livestock within a given area.

Policy: Range improvements will be initiated where management is necessary to restore or conserve rangeland resources and enhance range condition and livestock distribution. Range improvement practices shall be installed and maintained as specified in site-specific management plans for the individual units. Project planning will involve consideration of the proper design, size, location, and installation methods to advance the intended purpose of the improvement and maintain harmony with other uses, values, and activities. Construction and

installation will be in accordance with District specifications and instructions.

Grazing tenants shall be responsible for maintaining and repairing in good order and condition all buildings, structures and improvements related to grazing use found on the leaseholds. These include, without limitation, all fences, corrals, cattleguards, wells, pumps and pressure systems, ditches, spring boxes, water troughs and tanks, and wetland enclosures. Range improvement work financed or performed on park land by individuals or other agencies must be authorized.

Supplemental Feeding

In fall and early winter livestock often are unable to consume enough forage to meet their nutritional needs. This deficiency may be offset by feeding grains, molasses, or hay. During the late winter and spring, an adequate diet of all the essential nutrients, with the possible exception of salt and certain minerals, can be obtained from the natural forage. Forage quality follows a declining trend as the seasons progress, and further supplementation often is necessary.

Policy: Supplemental feeding of livestock on park land will be allowed to maintain animals in a healthy and economically viable condition. Supplementation will be used to facilitate improved livestock distribution and encourage more uniform use of the forage resource. Supplements will be placed in underutilized areas of the range away from water, whenever possible.

Supplemental feeding of livestock on park land will not be permitted to prolong grazing use in areas where established forage utilization levels have been reached or exceeded. Supplemental feeding sites will be relocated before minimum forage utilization levels in the surrounding area have been achieved.

In the event of unusual or emergency circumstances, such as drought or the loss of vegetation by wildfire, the District's range manager will have the discretion to allow short-term supplemental feeding until arrangements can be made to remove livestock from park land. This situation may require confining animals to a restricted location within the park to minimize resource impacts.

Other Rangeland Resource Issues

Watershed Management

Watershed management involves the supervision, regulation, maintenance, and wise use of the aggregate resources of a drainage basin to provide a maximum, long-term yield of water of desirable quality, and includes the control of erosion, pollution, and floods.

The condition of the soil and the vegetation it supports have a marked influence on the quality and quantity of the water contributed by a watershed. The litter of dried plant material plays an important part in conserving the rain and snow waters that reach the ground. The soil absorbs a part of the annual precipitation, while the remainder runs off on the surface until it reaches creeks and streams, and ultimately returns to the ocean. The surface water that percolates down through the litter of vegetation

into the soil supplies the moisture for trees, shrubs, and other plants that transpire it back into the air, while the remainder renews the underground water supplies that feed springs, streams, and wells.

The upper reaches of several watersheds in the East Bay are located on park district land. These higher watersheds are still in good condition and yield water of excellent quality in comparison to many of the lower elevation watersheds that have been modified to varying degrees by human activities.

Fire Prevention and Control

Fire is a constant threat to the vegetation and water resources of a watershed, and adequate fire prevention and control measures are necessary to minimize its impact. Fire may expose

large land areas by removing the protective cover of vegetation, subjecting these areas to erosion. Surface drainage then may carry increased sediments for several years after burning, causing widespread deterioration of water quality in the drainage basin.

Policy: Adequate fire control is essential on park lands to minimize damage to watersheds by fire. Measures for mitigating fire hazards on park land are described in the fire management and vegetation management sections of this document.

Soil Erosion

A certain amount of erosion occurring on park land takes place naturally and is a normal outcome of steep slopes, immature soils, and unstable geologic conditions. Other evidence of erosion can be attributed to the effect of past land uses, abnormal flooding, livestock grazing, the denudation of the landscape by wildfire, improper road drainage, illegal off-road vehicle use, rodent activities, and a host of other causes and effects.

Maintaining a proper cover of vegetation and vegetation residue is the most successful long-term approach to controlling soil erosion. Vegetation and vegetation residues form barriers to erosion and impede the overland flow of water by increasing infiltration and inhibiting runoff.

Policy: Existing and potential erosion hazards will be identified and corrective measures will be undertaken to repair damage and mitigate causative effects. Soil disturbance associated with construction and maintenance operations will be minimized. Disruptive activities in areas having unstable soils will be avoided, whenever possible. The progress of active gully erosion will be arrested and steps will be taken to restore these areas to stable conditions. Soil erosion associated with livestock grazing will be mitigated by reducing animal numbers, improving animal distribution, or implementing rotational grazing systems.

The District will assure that appropriate amounts of plant material remain on the ground for soil protection. Where vegetative cover has

been reduced, efforts will be taken to restore it. Best Management Practices to minimize the effects of non-point source pollution are currently being developed by the State of California, and will be adopted by the District as they become available.

Wildlife Management

The District recognizes the valuable ecological and public benefits of wildlife, and is dedicated to the conservation and enhancement of this resource. Park district lands support a wide variety of wildlife species associated with a broad spectrum of habitats.

The EBRPD is responsible for management of wildlife habitat, whereas the U.S. Fish and Wildlife Service, California Department of Fish and Game, and other agencies, have responsibility in matters pertaining to the management of the animals themselves. Fish and wildlife move freely between EBRPD land and those of other ownerships over which the District has no authority. As a result, State and Federal governments are better suited than the EBRPD to regulate animal populations. The EBRPD, however, must cooperate closely with these agencies to ensure proper management of this resource.

Policy: The District will conserve and enhance wildlife populations and their habitats, and minimize or eliminate conflicts and competition between wildlife and other uses. Priority will be given to the management needs of native wildlife species.

Comprehensive wildlife management guidelines will be developed to address wildlife conservation, habitat enhancement, and animal pest control issues affecting park land. Continual survey and data collection of EBRPD wildlife resources through the District's Resource Inventory and Monitoring Program (RIMP) will allow for the evaluation of wildlife responses to range management activities. Strategies for managing wildlife populations and habitats on park land will be refined periodically as new scientific research becomes available.

Cultural Resource Management

Cultural resources are manifestations of past cultures and societies that have scientific, historical or social value and significance. Cultural resources include paleontological, archaeological, historical, and scientifically valuable sites, areas, and objects. These resources possess information that represent or relate to a given culture or cultural system. Evidence of human behavior within these cultures is revealed in the form of products and by-products of human activities. The California Environmental Quality Act (CEQA) directs public agencies to avoid damaging effects on cultural resources, whenever possible.

Policy: Park rangelands will be managed to protect cultural resources from damage or loss. Range management activities will be conducted to eliminate existing or potential adverse impacts to significant prehistoric or historic cultural resources occurring on park land. The

District will provide appropriate protection for all identified archeological sites, wherever necessary, to maintain the integrity of existing resources.

A comprehensive survey by a professional archeologist will be conducted in areas of known archeological importance before soil disturbing project work will be allowed to proceed. In the event of discovery, an evaluation will be made regarding the significance of the find, and a subsequent course of action will be recommended in accordance with Appendix K of the CEQA guidelines and EBRPD policy.

Any evidence of archeological resources unearthed during normal project work by lessees or park personnel will be reported to a professional archeologist, and work will be halted until further notice. If it is determined that significant cultural values will be adversely affected by the proposed project, work may be abandoned, relocated, or modified to protect areas of significant cultural value.

Appendix A

Glossary

Animal Unit. Considered to be one mature cow with calf or their equivalent. Abbr. A.U.

Annual Grassland. Grassland on which the principal plants are annual grasses.

Annual Plant. A plant that completes its life cycle and dies in 1 year or less.

Annual Range. Range on which the principal plants are self-perpetuating annual grasses and forbs.

Archeology. The scientific study of the life and culture of ancient peoples, usually by excavation of settlements, artifacts, etc.

Aspect. The direction in which a slope of land faces (e.g., southern).

Association. See Plant Association.

Biomass. The amount of living matter per unit area of habitat.

Biotic. Refers to living components of an ecosystem (e.g., plants and animals).

Broadleaf. Having leaves that are broad and flat, rather than needlelike or grasslike.

Browse. That part of current leaf and twig growth of shrubs, woody vines and trees available for animal consumption.

Browsing. The act of eating leaf and twig growth of shrubs, woody vines, and trees.

Brush. Shrub vegetation.

Brushland. An area covered primarily with brush; shrubland.

Bunch Grass. A grass so-called because of its characteristic growth habit of forming a basal bunch or tuft.

Canopy. The upper or aerial portions of vegetation. Usually refers to trees, tall shrubs and vines.

Canopy Cover. The percentage of ground covered by a vertical projection of the overhanging plant foliage.

Carrying Capacity. The maximum number of specific kinds and classes of animals that can graze a unit of land for a specified time.

Chaparral. A plant community consisting of thickets of low-growing, drought-resistant, evergreen shrubs.

Climax (Community). A final, self-perpetuating community of plants and/or animals that persists under stable conditions.

Coastal Scrub. A plant community consisting of low shrubs intermixed with grassy meadows in a maritime climate.

Community. An assemblage of plants and/or animals in a given area in which the various species are more or less interdependent upon each other.

Community (Plant Community). An association of plants occurring together at any point in time. A unit of vegetation, (e.g., annual grassland community, chaparral community).

Coniferous Forest. A forest dominated by evergreen, cone-bearing trees and shrubs (e.g., pines, spruces, firs, etc.).

Continuous Grazing. Grazing on an area throughout the grazing season.

Cover. The plants or plant parts, living or dead, on the surface of the ground.

Cover Type. The existing vegetation of an area.

Crown. The leafy upper portion of a shrub or tree.

Deciduous (Plants). Plants having leaves that are shed at a certain stage of development in the life cycle.

Deferred Grazing. The delay of livestock grazing on a specific management unit for an adequate period of time to provide for plant reproduction, recovery or establishment.

Ecosystem. The complex of a community and its environment functioning as an ecological unit in nature.

Ecotone. A transitional zone between two adjacent plant communities.

Edge Effect. The result of the presence of two adjoining plant communities on the number and kinds of animals present in the immediate vicinity.

Endangered Species. A native species whose prospects of survival and reproduction are in immediate jeopardy from one or more causes.

Endemic. Native to or restricted to a particular area or region.

Erosion. Detachment and movement of soil or rock fragments by water, wind, ice, or gravity.

Evergreen (plant). A plant that retains green leaves indefinitely.

Exclosure. An area fenced to exclude animals, such as livestock.

Exotic. An organism or species which is not native to the region in which it is found.

Firebreak. A natural or human-made barrier used to prevent or retard the spread of fire, usually created by the removal of vegetation.

Flora. The plant species of an area.

Forage. All browse and herbaceous food that is available to livestock or wildlife.

Forage Production. The amount of forage produced on a given area within a growing season.

Forb. Any broadleaf herbaceous plant other than those in the grass (Poaceae), sedge (Cyperaceae) or rush (Juncaceae) families.

Fuel. Flammable vegetation.

Fuel Break. A block or strip of land on which flammable vegetation has been removed or replaced by vegetation with a lower fuel volume and/or flammability, and subsequently maintained to help control fire.

Genus. A classification of plants and animals with common characteristics, divided into subordinate species.

Grassland. Land on which the vegetation is dominated by grasses.

Grazing Capacity. The number of livestock a range unit will support each season over a period of years without injury to resources.

Grazing Distribution. The locating of livestock over the range to obtain uniform use.

Grazing Management Plan. A program of action designed to secure the best practicable control of the forage resources using grazing or browsing animals.

Grazing Pressure. The degree of grazing use on a land area.

Grazing Season. The period of time for which livestock are allowed to graze within any given year.

Grazing System. A specialization of grazing management which defines the periods of grazing and non-grazing.

Grazing Unit. An area of rangeland which is managed as an entity for livestock grazing.

Groundwater. Water within the earth that supplies wells and springs.

Growing Season. The portion of the year when the temperature and the availability of moisture permit plant growth.

Habitat. The natural abode of a plant or animal, including all biotic, climatic, and soil conditions, or other environmental influences affecting life.

Herb. Any flowering plant whose stem withers away to the ground after each season's growth.

Herbaceous. Having little or no woody tissue and persisting usually for a single growing season.

Herbage. Total amount of living herbaceous plants above ground.

Herbicide. A chemical used for killing or inhibiting the growth of plants.

Host-specific Biological Agent. An organism used for killing or inhibiting the growth of one specific pest.

Indigenous. Born, growing or produced naturally in an area or region; native.

Introduced (Species). A species not a part of the original plants or animals of an area.

Invasive (Plant). Plants that move into and establish themselves in another area.

Key Area. A portion of range, which because of its location, grazing value, and/or use, serves as an indicative sample of range conditions or trends.

Litter. The top layer of dead vegetation on the soil surface.

Livestock. Domestic animals kept or raised for use, pleasure, or profit.

Livestock Management. Application of technical principles and business methods to livestock production.

Monitoring. The orderly collection, analysis, and interpretation of data to evaluate progress toward meeting management goals.

Mulch. A layer of dead plant material on the soil surface.

Native (Species). A species which is one of the original plants or animals in a particular locality.

Naturalized (Species). A species not native to an area, which has adapted to the area and has established a stable or growing population.

Overgrazing. A condition whereby animals graze to the point of damaging vegetation and soil.

Overstory. The upper canopy of plants, especially trees, tall shrubs and vines.

Overuse. The harvesting of an excessive amount of the current year's plant growth, which, if continued, will result in overgrazing.

Palatability. The relish that an animal shows for a particular species, plant or plant part.

Pasture. A grazing area enclosed and separated from other areas by fencing or other barriers.

Perennial (Plant). A plant that has a lifespan of 3 or more years.

Pest. Any unwanted, destructive plant or animal.

Plant Association. A plant community characterized by essential uniformity in terms of its dominant species.

Plant Reserves. Energy stored by a plant for future growth and reproduction.

Prescribed Burning. The use of fire as a management tool under specified conditions for burning a predetermined area.

Productivity. The rate of vegetative production per unit area (e.g., pounds per acre).

Range. Land grazed by livestock.

Range Analysis. A study used to determine the productivity of an area of rangeland.

Range Condition. The existing status of the range brought about by climate, grazing, and all other factors that influence soil and vegetation.

Range Improvement. Any structure or practice used to improve the management or conservation of range resources by livestock (e.g., gates, fences, stock trails, water developments, seeding).

Range Inventory. An itemized list of resources of a management area.

Range Management. A land management discipline that applies an organized body of knowledge known as range science to renewable natural resource systems for two purposes: (1) protection, improvement, and continued welfare of the basic range resource, which may include soils, vegetation, and animals; and (2) optimum production of goods and services in combinations needed by humankind.

Range Site. An area of land having a combination of edaphic, climatic, topographic and natural biotic factors that is significantly different from adjacent areas.

Rangeland. Land on which the native vegetation is predominantly grasses, grass-like plants, forbs, or shrubs that provides forage for livestock and wildlife.

Rare Species. A native species, which although not presently threatened with extinction, is in such small numbers throughout its range that it may become endangered if its present environment worsens.

Relict. A remnant or fragment of a climax plant community that remains from a former period when it was more widely distributed.

Remnant Population. See Relict.

Residual Dry Matter. The amount of dried, dead plant matter left on the soil at the end of the grazing season.

Residual Mulch. The amount of dead plant matter left on the soil at the end of the grazing season.

Rest. Leaving an area ungrazed, usually for one full growing season.

Riparian Vegetation. Plant communities dependent upon the presence of free water near the ground surface, especially along streams and rivers.

Rotational Grazing. A system of grazing where animals are moved between two or more separate pastures on a predetermined schedule.

Salting. Providing salt as a mineral supplement for animals. Also, placing salt on the range in such a manner as to improve distribution of livestock.

Savanna. Grassland with scattered trees, either as individuals or as clumps, often a transitional zone between true grassland and forest.

Scrub. Vegetation consisting mainly of shrubs.

Seep. Wet area, normally not flowing, arising from an underground water source.

Sensitive Species. A native species considered a viable candidate for classification as rare, threatened, or endangered.

Shrub. A low-growing, woody plant with several permanent stems as opposed to a single trunk.

Shrubland. Any land on which shrubs dominate the vegetation.

Species. The fundamental classification of plants and animals, a subdivision of a genus, consisting of organisms with many persistent, common characteristics and generally capable of interbreeding only among themselves.

Spring. An isolated source of surface water originating from an underground aquifer.

Stand. A relatively uniform group of plants growing in a continuous area.

Stocking Rate. The number of specific kinds and classes of animals grazing or using a unit of land for a specified period of time.

Subshrub. A low plant with several permanent woody stems that annually grow new, non-woody shoots that die back at the end of the growing season.

Succession. The progressive replacement of one plant community with another on a site until a stable or climax community is established.

Successional Stage. One of the plant communities that occurs during succession on a particular site.

Supplemental Feeding. The practice of supplying concentrated or harvested feed to correct deficiencies of the range diet.

Thatch. A matted layer of accumulated, partially decayed plant material covering the soil.

Threatened Species. A native species, which although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.

Understory. Plants growing beneath the canopy of other plants, usually referring to grasses, forbs and low shrubs under trees or tall shrubs.

Use (grazing). The proportion of the current year's forage production that is consumed or destroyed by grazing animals.

Use Standards. An established basis of comparison in measuring the amount of use.

Utilization. See Use (grazing).

Vegetation Type. A distinctive stand of plant species or combinations of species which dominate a given area.

Water Table. The upper limit of a portion of the ground saturated with water.

Watershed. The area drained by a stream or river system.

Weed. Any plant growing where unwanted.

Wetland. An area with soils that are usually saturated with water, and support mostly water-loving plants.

Wetland Community. Plant community that occurs on sites with soils typically saturated with or covered with water most of the growing season.

Wildlife. Wild vertebrate animals, not including fish.

Woodland. A land area occupied by trees; a forest or woods.

Appendix B

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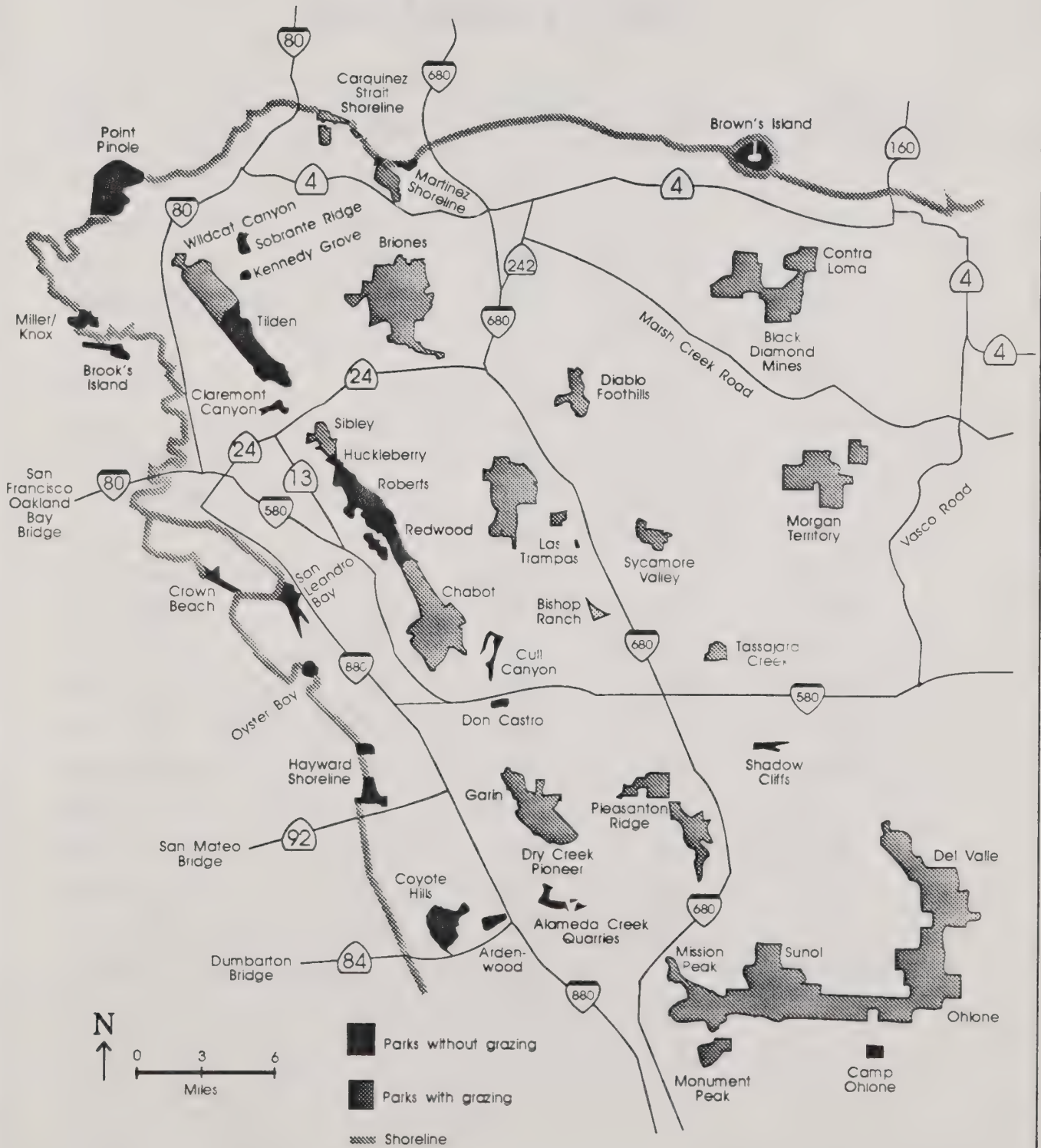
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Appendix C

Map of Grazing Areas



Note: Detailed maps of individual grazing units are on file in the Land Stewardship Department

Appendix D

Grazing Area Statistics

(as of January 1, 1990)

Park Name	Total Acreage	Grazing Lease Acreage	% of Acres Grazed	Authorized AUM Level
Bishop Ranch	372	370	99.5	300
Black Diamond Mines	3,650	3,452	94.6	2,700
Briones	5,434	4,231	77.9	2,844
Carquinez Strait Shoreline	513	365	71.2	457
Chabot	4,927	556	11.3	450
Contra Loma	776	400	51.5	312
Del Valle	4,500	1,979	44.0	980
Diablo Foothills	977	700	71.6	480
Dry Creek Pioneer	1,563	1,553	99.4	1,216
Garin	1,317	1,216	92.3	600
Las Trampas	3,558	2,135	60.0	1,546
Mission Peak	1,978	1,900	96.1	1,550
Monument Peak	618	616	99.7	500
Morgan Territory	3,496	3,494	99.9	1,730
Ohlone	5,676	5,237	92.3	1,710
Pleasanton Ridge	1,771	1,530	86.4	1,060
Sibley	386	157	40.7	70
Sunol	6,818	6,282	92.1	3,100
Tassajara Creek	450	445	98.9	445
Wildcat Canyon	2,429	2,205	90.8	2,000
Totals	51,209	38,823	75.8	24,050

Appendix E

Grazing License

THIS GRAZING LICENSE is entered into _____,
19_____, between the EAST BAY REGIONAL PARK DISTRICT (Licensor)
and _____ (Licensee).

1. PREMISES

a. Licensor hereby licenses to Licensee, and Licensee hereby licenses from Licensor, on the terms and conditions hereinafter set forth, that certain unimproved real property described in Exhibit A attached hereto and made a part hereof.

b. Licensor makes no warranties and/or representations to Licensee concerning the suitability of the premises for grazing purposes.

c. Licensee's possession of the premises is subject to:

(1) All existing easements, servitudes, licenses and rights of way for canals, ditches, levees, roads, highways and telegraph, telephone and electric power lines, railroads, pipelines and other purposes, whether recorded or not; and

(2) The primary rights of other persons using the regional park of which the premises forms a part.

2. INITIAL TERM, EXTENSION, POSSESSION

a. The term of this License shall be for the periods stated in Exhibit A. If Licensee remains in possession of the premises after expiration or termination of the term, or after the date in any notice given by Licensor to Licensee terminating this License, with Licensor's written consent and in the absence of a contrary written agreement between the parties, such possession by Licensee shall be deemed to be a tenancy from month-to-month terminable on thirty (30) days' written notice given at any time by either party to the other at a monthly rental, payable in advance, equal to one-twelfth (1/12) of the aggregate rental payable during the last full calendar year of the term, unless during the last full calendar year of the term there was a reduction or abatement of rental under any provision of this License, in which event the fraction shall be applied to the twelve months next preceding the date of such reduction or abatement. All provisions of this License except those pertaining to rental shall apply to the month-to-month tenancy.

Notwithstanding anything herein contained to the contrary, Licensor shall have the right at any time during the term hereof to terminate this License upon sixty (60) days' prior written notice to Licensee.

b. Notwithstanding subparagraph a. above to the contrary, Licensor shall have the right to terminate this License as to all or any portion of the premises if Licensor requires the same to be devoted to public park uses, or the Department of Housing and Urban Development or any other public agency which has granted funds to acquire the premises or any part thereof requires termination of this License. Said termination shall become effective upon Licensor giving Licensee sixty (60) days' prior written notice thereof. In the event of such termination, any claim for damages shall be limited to a pro-rata refund of rental paid in advance but not earned; and said refund shall be in the same proportion to the entire rental

paid in advance, but not earned, as the acreage as to which the License is terminated bears to the acreage of the entire premises.

c. Licensee agrees that in the event of the inability of Licensor to deliver possession of the premises at the commencement of the initial term, Licensor shall not be liable for any damage caused thereby nor shall this License be void or voidable, but Licensee shall not be liable for rent until such time as Licensor offers to deliver possession of the premises to Licensee, but the term hereof shall not be extended by such delay. If Licensee, with Licensor's consent, takes possession prior to the commencement of the term, Licensee shall do so subject to all of the terms, covenants, and conditions hereof and shall pay rent for the period ending with the commencement of the initial term at the same rental as that prescribed for the first month of the term, pro-rated at the rate of 1/30th thereof per day.

3. RENTAL

a. As payment for the License, Licensee hereby agrees to pay to Licensor without deduction, set-off, prior notice or demand the sum stated in Exhibit A per year, payable semi-annually, in advance, with the first payment due on the date the term of this License commences, and each payment due six months thereafter. Rent shall be paid to Licensor at the address set forth in Paragraph 19 below.

b. Rents shall be payable in cash, or labor, or labor and materials in lieu of cash; however, credit for such labor, or labor and materials, shall not be granted unless Licensee obtains prior written consent of Licensor for such credit and such credit will be applied to the next annual or installment payment due following completion of said work.

4. USE

a. The premises are hereby licensed to Licensee upon the express condition that Licensee shall use said premises for _____ grazing and for no other purpose without the prior written consent of Licensor.

b. Licensee shall conduct its operations on the demised premises in a farmer-like manner. Licensee shall bury (in a manner satisfactory to Licensor's representatives) or carry away any livestock which may die on the premises. Licensee has a duty to remove or bury dead livestock. If Licensee fails to bury or remove such livestock within five days of notice by Licensor's requesting such removal, Licensor may bury or remove such livestock and charge the Licensee for the time and material expended. Licensee shall immediately report any case of infectious animal disease appearing in livestock on the premises to all proper governmental authorities and shall take all steps required to isolate, control and eliminate any such disease, all at Licensee's own expense.

c. Licensor shall advise Licensee when, in the opinion of Licensor's authorized representative, Licensor shall require the reseeded of any areas of the premises with approved pasture grasses, and Licensee shall reseed said areas with such grasses when so instructed, at Licensee's sole cost and expense.

d. Licensee shall not cut, nor permit to cut, any trees on the premises or remove windfalls unless the prior written consent of Licensor is obtained.

e. Licensee shall not carry on or permit upon said premises any nuisance, or anything against public policy, or commit, or suffer to be committed, any waste upon the premises.

f. Licensee must inform Licensor, semi-annually during the grazing season, or upon the request of Licensor, of the number of animals being stocked on the premises.

g. Licensee shall comply with all laws, permits, statutes, ordinances and rules and other requirements regulating the conduct of Licensee's business.

5. PROPERLY UTILIZED ANNUAL RANGE

The following conditions and requirements will constitute proper utilization of Park District rangelands:

a. Proper forage utilization shall be determined by Licensors authorized representative, based on a determination of the amount of residual dry matter, or mulch, that remains on the ground following grazing. The soil surface shall be covered by a residual layer of both standing and fallen vegetation that meet minimum residual dry matter (RDM) standards established by the Licensor as follows:

Minimum residual mulch requirements:

- 0 to 30% slope: leave 600 lbs./acre
- 30 to 50% slope: leave 800 lbs./acre
- greater than 50% slope: leave 1000 lbs./acre

Licensee recognizes that individual grazing units may have special circumstances that require that additional mulch remain. Residue requirements will vary according to the need to promote soil stability, maintain plant productivity, enhance visual and recreational values, and/or protect critical wildlife habitat.

b. Ravines and gullies will remain stabilized against active erosion.

c. The range will exhibit a healthy diversity of desirable grasses and forbs and be sustained in this condition over time.

d. The Licensor recognizes that in some years it may be necessary to reduce stocking or remove animals earlier than may be expected due to unusual growing conditions.

Licensee is responsible at all times to insure that the above conditions are met. Licensor shall advise Licensee when, in the opinion of Licensor's authorized representative, any of the conditions above-described are not being accomplished. Licensor shall have the right to direct the termination of grazing in the event of overgrazing or direct the amount of grazing that will not constitute overgrazing. Should the License be terminated, the Licensee shall have no recourse to damages against the Licensor or its employees.

6. ACCEPTANCE AND SURRENDER OF PREMISES

By entry under this License, Licensee accepts the premises in their present "as is" condition and agrees, on the last day of the term or on sooner termination of this License, to surrender the premises and the appurtenances to Licensor in the same condition as when received, reasonable use, wear and damage by fire, Act of God, or the elements excepted, and to remove all of Licensee's property from the premises.

7. MAINTENANCE OF IMPROVEMENTS

a. Licensee shall maintain, repair and replace, if necessary, in good order and condition throughout the term hereof, all buildings, structures and/or other improvements related to grazing use on the premises ("improvements") including, without limitation, all fences, corrals, wells, pumps and pressure systems, ditches, water troughs and roadways, ordinary wear-and-tear excepted.

b. In the event Licensee shall fail to perform its obligations hereunder, Licensor, in addition to all other remedies available hereunder or by law, and without waiving any said alternative remedies, may perform same and Licensee agrees to repay Licensor the cost thereof as part of the rental payable as such on the next day upon which rent becomes due, and failure to pay same shall carry with it the same consequences as failure to pay any installment of rental. Licensee waives all rights to make repairs at the expense of Licensor as provided for in any statute or law in effect at the time of execution of this License or

any amendment thereof or any other statute or law which may be hereafter enacted during the term of this License.

8. ALTERATIONS, LIENS

a. Licensee agrees not to make any alterations of, changes in, or additions to the premises without the prior written consent of Licensor. As a condition to granting its consent, Licensor may require that:

(1) Licensee shall submit for Licensor's approval detailed final plans and specifications and working drawings of the proposed alterations and the name of its contractor at least thirty (30) days before the date it intends to commence the alterations.

(2) All alterations must be approved by all appropriate government agencies, and all applicable permits and authorizations are obtained prior to commencement of the alterations and such alterations shall be completed with due diligence in compliance with the plans and specifications and all applicable laws.

(3) Licensee shall obtain the insurance requested by Licensor in its sole discretion.

All alterations, additions and improvements, including fixtures, made in, to, or on the premises, except unattached, movable fixtures, shall be the property of Licensor and shall remain upon and be surrendered with the premises, except that Licensee will ascertain from Licensor within thirty (30) days before the end of this term whether Licensor desires to have the premises, or any part or parts thereof, restored to their condition when the premises were delivered to Licensee and, if Licensor shall so desire, Licensee shall so restore said premises or such part or parts thereof before the end of the term of this License, entirely at Licensee's own cost and expense.

b. Licensee agrees that, if any such alterations, changes or additions are to be made, same shall not be commenced until ten days after receipt of the written consent of Licensor required by this paragraph in order that Licensor may post appropriate notices to avoid any liability on account thereof. Licensee agrees to indemnify, defend, protect and hold harmless Licensor from all liens, claims, demands, liabilities arising out of any work performed, materials furnished or obligations incurred by or for Licensee upon said premises during said term and agrees not to suffer any such lien or other lien to be created.

9. UTILITIES

Licensee agrees to pay for all the water, fuel, gas, oil, heat, electricity, power, materials and services which may be furnished to or used in or about said premises related to grazing use during the term of this License.

10. ENTRY AND INSPECTION

Licensee agrees that Licensor and its agents may enter on the premises to inspect them, make any changes or alterations or repairs which Licensor shall consider necessary for the protection, improvement or preservation thereof, or to post any notice provided for by law, or otherwise to protect any and all rights to Licensor; and Licensee shall not be entitled to any abatement of rental by reason of the exercise by Licensor of any such rights herein reserved. Nothing herein contained shall be construed to obligate Licensor to make any changes, alterations or repairs.

11. ASSIGNMENT AND SUBLETTING

This License is personal to Licensee and is not assignable nor transferable by Licensee in whole or in part.

12. HOLD HARMLESS

Licensee shall indemnify, defend, protect and hold Licensor harmless from all liabilities, penalties, losses, damages, costs (including, without limitation, attorneys' fees), expenses, causes of action, claims and/or judgments arising out of or in connection with any injury or damage to any person or persons including, without limitation, Licensee, Licensor, their servants, agents and employees, or property of any kind whatsoever and to whomsoever belonging including, without limitation, Licensee, Licensor, their servants, agents and employees, from any cause or causes whatsoever while in, upon or in any way connected with this License, said premises or its appurtenances during the term of the License or any occupancy hereunder or property of Licensee not on the premises. Notwithstanding the foregoing to the contrary, however, Licensee shall not be liable for any damages or claims for damages by reason of the injury or death to any person or persons, including Licensee, or damage or destruction of any property, including Licensee's occasioned by or resulting from the sole gross negligence of Licensor, its agents, officers, servants, employees or independent contractors, and with respect to any such claims so arising, Licensor agrees to indemnify, defend, protect and hold Licensee harmless therefrom.

13. INSURANCE

a. Licensee shall procure, and keep in force during the term of the License, at Licensee's own cost and expense, the following policies of insurance with companies licensed to do business in the State of California and which are acceptable to the Licensor in Licensor's sole opinion. Licensee shall, prior to commencement of the term, and at any time upon Licensor's request, supply Licensor with a certificate showing that such insurance is in force.

(1) Workers' Compensation as required by law and Employer's Liability with limits of \$500,000 per occurrence.

(2) Public Liability (bodily injury and property damage) including premises and operations, blanket contractual liability, broad form property damage, personal injury and owner's and contractor's protective liability in an amount not less than \$1,000,000 per occurrence.

(3) Automobile Liability (bodily injury and property damage) extending to owned, non-owned and hired vehicles and including contractual liability covering all liability assumed under the License in an amount not less than \$1,000,000 per occurrence.

Each of the above policies contains a provision that the policy shall not be cancelled or materially changed without thirty (30) days' prior written notice to Licensor. No cancellation provision in any insurance policy shall be construed in derogation of the continuous duty of Licensee to furnish the required insurance during the term of the License.

b. The policies listed under a.(1) above shall contain a waiver of subrogation against Licensor, its officers, directors, agents and employees.

c. The policies listed under a.(2) and (3) above shall be primary insurance and any other insurance available to Licensor under any other policies shall be excess over the insurance outlined above.

d. That coverage afforded on behalf of Licensor under (2) and (3) above shall be primary insurance and any other insurance available to Licensor under any other policies shall be excess over the insurance outlined above.

e. Upon written request by Licensor, the insurer or his agent will furnish a copy of any policy cited above, certified to be a true and complete copy of the original.

14. DEFAULT

Licensee hereby agrees that:

- a. Should Licensee fail to pay the rental herein reserved, or any part thereof, or any sum required by Licensee to be paid to Licensor at the times or in the manner herein provided; or
- b. If Licensee shall abandon or vacate said premises, or
- c. If default should be made in any of the other covenants or conditions on Licensee's part herein contained, and not be cured within ten (10) days after written notice by Licensor to Licensee of such default.

Licensor, or Licensor's agents and representatives, with or without terminating this License, shall have the right to re-enter the premises or any part thereof, either with or without process of law, and expel, remove and put out Licensee or any person or persons occupying said premises and remove all personal property and livestock therefrom, using such force as may be necessary to again repossess said premises, without prejudice to any remedy which might otherwise be available at law or equity, and without liability to any person for damages sustained by reason of such removal. No such re-entry or taking of possession of said premises by Licensor shall be construed as an election on its part to terminate this License unless a written notice of such intention be given Licensee. Licensor may likewise, at Licensor's option, but at the cost of Licensee and in addition to any other remedies which Licensor may have upon such default or failure or neglect and without notice to Licensee, petition the Superior Court of the State of California for and be entitled as a matter of right to the appointment of a Receiver and said Court may appoint such Receiver and vest in him such powers and authority as may be necessary or proper to fully protect all the rights herein granted or reserved to Licensor.

Licensor may likewise, at Licensor's option and in addition to any other remedies which Licensor may have upon such default, failure or neglect, let and relet said premises in whole or in part, at such rental and upon such terms and for such length of time, whether less or greater than the unexpired portion of the term of this License, as Licensor may see fit, and Licensee shall be liable unto Licensor for any deficiency between the rentals so procured by Licensor for the period of said letting or reletting not to exceed, however, the balance of the original term hereof, after deducting therefrom the cost of such letting or reletting (including the cost of any such alterations or other changes), and the rental herein reserved for a period or periods identical with the term of said letting, or reletting, and Licensor may institute action for the whole of such deficiency immediately upon effecting any letting or reletting and shall not thereafter be precluded from further like action in the event such letting or reletting shall not embrace the whole unexpired portion of the term hereof, or Licensor may monthly, or at such greater intervals as it may see fit, exact payment of said deficiency then existing, and Licensee agrees to pay said deficiency then existing unto Licensor from time to time when called upon by Licensor so to do.

Any rentals received from reletting shall be applied to the payer of: first, any indebtedness from Licensee to Licensor other than rent due; second, all costs, including for maintenance incurred by Licensee; and third, rent due and unpaid under this License. Should this License not be terminated, Licensor may, notwithstanding such letting or reletting, at any time thereafter elect to terminate it; or, should this License, prior to the expiration of the term hereof be terminated by Licensor by reason of any breach hereof by Licensee. Licensor shall thereupon, at its option, be entitled to recover from Licensee:

- (1) The worth, at the time of the award, of the unpaid rent that had been earned at the time of termination of this License;
- (2) The worth, at the time of the award, of the amount by which the unpaid rent that would have been earned after the date of termination of this License until the time of award exceeds the amount of the loss of rent that Licensee proves could have been reasonably avoided;
- (3) The worth, at the time of the award, of the amount by which the unpaid rent for the balance of the term after the time of award exceeds the amount of the loss of rent that Licensee proves could have been reasonably avoided; and

(4) Any other amount, and court costs, necessary to compensate Licensor for all detriment proximately caused by Licensee's default.

"The worth, at the time of the award," as used in (1) and (2) of this paragraph, is to be computed by allowing interest at the maximum rate an individual is permitted by law to charge. "The worth, at the time of the award," as referred to in (3) of this paragraph, is to be computed by discounting the amount at the discount rate of the Federal Reserve Bank of San Francisco at the time of the award, plus 1%.

15. WEED AND PEST CONTROL

Licensee shall, at its sole cost and expense, control ground squirrels, mice, rats, gophers, and other animals and all weeds encroaching upon the premises as specified by Licensor's Integrated Pest Management (IPM) and Range Management Specialists. Licensor will be responsible for reducing large pest populations to a manageable level. The IPM and Range Management Specialists will determine at what point subsequent responsibility for pest control will be transferred to the Licensee.

The evaluation and control of pest problems shall be performed in accordance with Licensor's pest management policies and practices, and applicable State and County regulations. The Licensee shall be provided with said Pest Management Policies and Practices manual for guidance. An annual pest management site assessment will be made of the premises by the Licensor's IPM Specialist and/or Range Management Specialist, and the Licensee shall be notified of the pest status, need for, and timing of pest control.

The Licensor shall notify the Licensee of the necessity for and proper timing of such control in writing. The Licensee shall, within thirty (30) days of such notice, comply as directed. In the event that Licensee does not so comply, Licensor may take such steps as are required to fulfill Licensee's obligations hereunder and charge the cost for control to Licensee, which cost Licensee agrees to pay upon demand.

16. LICENSEE AS INDEPENDENT CONTRACTOR

Licensee enters into this License as an independent contractor and not as an agent or employee of Licensor, as the word "employee" is defined in the Workmen's Compensation Act of the State of California.

17. CONFLICT OF INTEREST

Licensee hereby warrants and represents to Licensor that no officer and/or employee of Licensor nor any member of Licensor's Board of Directors has or will have, directly or indirectly, any interest whatsoever in this License.

18. COSTS OF SUIT

If legal action shall be brought by either of the parties hereto for unlawful detainer of the premises, or for the recovery of any rent due under the provisions of this License, or because of the breach of any term, covenant or provisions hereof, the party prevailing in said action shall be entitled to recover from the party not prevailing costs of suit and a reasonable attorney's fee.

19. NOTICES

Wherever this License provides for notices between the parties, or wherever the law requires or gives the right of serving a notice, the same shall be served personally or by registered or certified mail, addressed to Licensor as follows:

East Bay Regional Park District
11500 Skyline Boulevard
Oakland, CA 94619-2443

and addressed to Licensee at the address stated in Exhibit A provided, however, that Licensor and Licensee may at any time in the manner provided herein change the place of receiving notice.

20. SURRENDER OF LICENSE

No act or conduct of Licensor shall be deemed to be or constitute an acceptance of the surrender of the premises by Licensee prior to the expiration of the term hereof, and such acceptance by Licensor of surrender by Licensee shall only flow from and must be evidenced by a written acknowledgement of acceptance of surrender by Licensor. The voluntary or other surrender of this License by Licensee, or a mutual cancellation thereof, shall not work a merger, and shall, at the option of Licensor, terminate all or any existing sublicenses or subtenancies, or concessions, or may at the option of Licensor operate as an assignment to him of any or all such sublicenses or subtenancies or concessions.

21. CUMULATIVE REMEDIES, NON-WAIVER

The receipt by Licensor of any rent or payment with or without knowledge of the breach of any covenant hereof shall not be deemed a waiver of any such breach and no waiver by Licensor of any sum due hereunder or any provision hereof shall be deemed to have been made unless expressed in writing and signed by Licensor. No delay or omission in the exercise of any right or remedy accruing to Licensor upon any breach by Licensee under this License shall impair such right or remedy or be construed as a waiver of any such breach theretofore or hereafter occurring. The waiver by Licensor of any breach of any term, covenant or condition herein contained shall not be deemed to be a waiver of any subsequent breach of the same or any other term, covenant or condition herein contained. All rights, powers, options or remedies afforded to Licensor either hereunder or by law shall be cumulative and not alternative and the exercise of one right, power, option or remedy shall not bar other rights, powers, options or remedies allowed herein or by law.

22. TAXES

Licensee agrees to be responsible for all taxes that arise by virtue of the imposition of a possessory interest tax and such other taxes as arise from the grazing operation.

23. MISCELLANEOUS

a. It is agreed by and between the parties hereto that all the agreements herein contained upon the part of Licensee, whether technically covenants or conditions, shall be deemed conditions for the purpose hereof, conferring upon Licensor, in the event of breach of any of said agreements, the right to terminate this License.

b. Licensee agrees, at any time and from time to time within ten (10) days of written request from Licensor, to execute, acknowledge and deliver to Licensor a statement in writing certifying that this License is unmodified and in full force and effect (or if there have been modifications that the same is in full force and effect as modified, and stating the modifications), and the dates to which the rent and other charges have been paid in advance, if any, it being intended that such a statement delivered pursuant to this paragraph may be relied upon by any prospective purchaser of the premises.

c. In case there is more than one Licensee, the obligation of Licensee's executing this License shall be joint and several. The words "Licensor" and "Licensee" as used herein shall include the plural as well as

the singular. The covenants and agreements contained herein shall be binding upon and be enforceable by the parties hereto and their respective heirs, executors, administrators, successors and assigns, subject to the restrictions herein imposed on assignment by Licensee.

d. Time is of the essence of this License and of each and every covenant, condition and provision herein contained.

e. The paragraph headings of this License are inserted only as a matter of convenience and for reference and in no way define, limit or describe the scope or intent of this License or any provision thereof or in any way affect this License.

f. The word "term" as used herein shall be deemed to refer to both the initial and extended term.

g. This License shall be governed by the Laws of the State of California.

h. This License supersedes any prior agreements and contains the entire agreement of the parties with respect to their subject matter contained herein.

**IN WITNESS WHEREOF the parties hereto have subscribed their names,
the day and year first hereinabove written.**

LICENSOR

LICENSEE

EAST BAY REGIONAL PARK DISTRICT

By _____

By _____

EXHIBIT A

TO THAT CERTAIN GRAZING LICENSE

DATED _____, 19__

**BETWEEN THE EAST BAY REGIONAL PARK DISTRICT ("Licensor") and
_____ ("Licensee")**

1. PREMISES

The premises are located in the City of _____,

County of _____, State of California, and
described as follows:

2. INITIAL TERM

The initial term shall be for _____

commencing _____, 19__, and

expiring _____, 19__.

3. RENTAL

Rental: _____

4. NOTICES

Licensee's address: _____

Resolution No. _____

INITIALS:

Adopted: _____

Licensor Licensee

EXHIBIT C

ADDENDUM TO LICENSE

ANIMAL UNIT MONTH

A license-year is defined as the 12 month period commencing each November 1st and extending through October 31st of the following year. For each and every license-year commencing on the first day of the term of this License, and thereafter on November 1 of each year during said term, the annual rental shall be determined in accordance with the "Rental Adjustment Table," hereinafter contained, and be adjusted upward or downward from license-year to license-year, depending upon the grazing capacity of the premises as determined by Licensor, and whether the average selling price of beef cattle, as hereinafter computed, is higher or lower than the corresponding average selling price for the preceding license-year.

For the purpose of computation of rental, the average selling price of beef cattle shall be taken as the average selling price of Choice Feeder steers and heifers, 500-800 lbs., as reported on Stockton Range and Feedlot Sales by the Federal-State Market News Service for the month of June of each license-year. The rental rate determined from this process will be used to compute grazing rents for the subsequent license-year beginning November 1st.

In the event that said average sales price of beef cattle is not obtainable in any year from said Federal-State Market News Service as now constituted, then the average sales price to be used in determining the annual rental shall be obtained from some other authentic source to be selected by Licensor as providing a comparable price for the purpose. It is further mutually understood and agreed that in the event the Federal Government or any agency whatever in any manner subsidizes the raising of beef cattle, thereby effecting a lower average sales price as reported on the Stockton Range and Feedlot Sales referred to above, the annual rental shall be increased to fully offset the effect of the subsidy payment on the sales price of cattle.

The annual rental to be paid by Licensee for any given license-year shall be determined through the use of the attached Rental Adjustment Table, whereby the average selling price of beef cattle per hundred-weight, as so reported for the month of June of that license-year as defined above, shall be compared with the appropriate price range found in Column 1 of said table to determine the corresponding rental rate found opposite this row in Column 2. The total rental payment due to Licensor shall be computed by multiplying this rental rate by the total number of animal unit months of feed authorized in writing by Licensor for said license-year.

The annual rental due in advance as hereinabove estimated shall be due and payable by Licensee in lawful money of the United States in equal semi-annual installments on the first day of December and the first day of June of each year during the term hereof, except that the estimated rental for the first half-year hereunder shall be due and payable upon the execution of this License. Any such rentals, if not paid in full when due, shall bear interest at the rate of ten percent (10%) per annum from the due date until paid. Any and all indebtedness, accrued because of such non-payment of rent, shall become a lien on any and all crops, livestock, or other property which Licensee may have on the premises.

Prior to issuance of the second installment billing for each current license-year, Licensor shall compute the actual rental for the current license-year as hereinbefore set forth, and Licensee shall thereafter be given a cash credit or a demand for additional rental, depending upon whether, based on actual animal unit month use, the estimated rent paid in advance has been greater than or less than the amount computed for the current license-year. Should a demand for additional rental be made, the same shall be immediately

due and payable, and if not paid within thirty (30) days of the date of demand, Licensor may at its option terminate this License, in which case the provisions of default as set forth in this License shall apply.

Licensee is hereby authorized to use upon the premises during the license-year commencing _____, 19____, and ending _____, 19____, the following amount of the annual forage production not to exceed _____ animal unit months.

Each and all of the foregoing numbers of animal-months of feed may at the option of the Licensor be changed by Licensor alone for any or all succeeding license-years. Written notice of any such change will be given to Licensee by the Land Stewardship Department of Licensor on or before September 1 preceding any license year. Unless so changed, said number or numbers for any license-year shall remain as last authorized by Licensor.

This License is subject to the following additional reservations, conditions and agreements, and Licensee does hereby further agree with Licensor as follows:

1. Licensee shall, during said term, pay to Licensor at its office situated at 11500 Skyline Boulevard, Oakland, CA 94619, or at such other place as may be designated in writing by Licensor, the said rent and each and every installment thereof, at the time and in the manner aforesaid. Said rent shall be due and payable on the basis of the determination by Licensor of the animal unit month capacity of the demised premises.

2. The words "animal unit month" as used in this License shall mean the utilization of the demised premises for feeding purposes by one animal, 1,000 pounds or more in weight, for a period of one month. Authorized animal unit months shall be assigned on the basis of the carrying capacity of the demised premises as determined by Licensor, and stocking rate shall be computed by calculating the relative forage requirements of each of the kind or kinds of livestock intended to be grazed on the premises in any one grazing season, as expressed by the following conversion factors.

Kind of Livestock	Animal-Months
Steer, 2 years & older (1,000# or more)	1
Cow or Cow & Calf (Calf up to 6 months)	1
Bull	1-1/2
Horse	1-1/4
Yearling to 2-year-old (750# to 1,000#)	3/4
Calf to Short Yearling (up to 750#)	1/2

As the kind or kinds of livestock vary during any license-year, the resulting change in the number of animal unit months kept on the premises will remain consistent with the authorized use level established by the Licensor.

3. In addition to the annual changes in animal unit month capacities of the demised premises hereinabove provided for, said capacities may also be reduced at any other time at the sole discretion of the Land Stewardship Department of Licensor, or be revised upward by mutual agreement of Licensee and the Land Stewardship Department of Licensor, upon written notification of Licensor, with any such agreement remaining in force and effect until the beginning of a new license-year, unless sooner terminated or amended by Licensor in writing. Under such agreement, the rental for the demised premises shall be revised upward or downward to reflect such change in animal unit month capacity.

In the event of an increase in animal unit month capacity, the rental to cover such increase for the remainder of the license-year shall be due and payable upon the execution of the mutual agreement. In the

event of a decrease in said capacity, the rental covered by said decrease shall be credited against the next installment of rental due from Licensee. The Land Stewardship Department of Licensor may, at its discretion, charge a reduced rate per animal unit month in situations where it desires to employ livestock grazing to achieve specific fire hazard reduction or resource management objectives other than those derived from routine grazing practices.

The premises shall be used by Licensee only for grazing those animals designated in the Table above entitled "Kind of Livestock." Licensee shall limit the number of livestock to be grazed upon said premises and the period of their grazing so that the authorized number of animal unit months of grazing shall not be exceeded. Should said premises be grazed in excess of the authorized number of animal unit months, Licensee shall, within ten (10) days of receipt of written notice so to do, remove all or such number of livestock as are necessary to comply with the maximum capacity authorized by Licensor. In addition to all other rights which Licensor may have or exercise under this License because of such overgrazing, Licensee shall pay to Licensor promptly upon demand twice the rent in this License provided for each animal unit month or portion thereof grazed in excess of said authorized number, such amount being hereby agreed upon as the minimum damage to Licensor from such excess usage.

RENTAL ADJUSTMENT TABLE

Column 1	Column 2	Column 1	Column 2	Column 1	Column 2
Choice Feeder Steers (500 - 800 lbs.) Average Selling Price per cwt. for June of Lease Year	Rental per Animal Unit Month	Choice Feeder Steers (500 - 800 lbs.) Average Selling Price per cwt. for June of Lease Year	Rental per Animal Unit Month	Choice Feeder Steers (500 - 800 lbs.) Average Selling Price per cwt. for June of Lease Year	Rental per Animal Unit Month
\$45.01 to 45.50	10.00	\$63.51 to 64.00	11.85	\$82.01 to 82.50	13.70
45.51 to 46.00	10.05	64.01 to 64.50	11.90	82.51 to 83.00	13.75
46.01 to 46.50	10.10	64.51 to 65.00	11.95	83.01 to 83.50	13.80
46.51 to 47.00	10.15	65.01 to 65.50	12.00	83.51 to 84.00	13.85
47.01 to 47.50	10.20	65.51 to 66.00	12.05	84.01 to 84.50	13.90
47.51 to 48.00	10.25	66.01 to 66.50	12.10	84.51 to 85.00	13.95
48.01 to 48.50	10.30	66.51 to 67.00	12.15	85.01 to 85.50	14.00
48.51 to 49.00	10.35	67.01 to 67.50	12.20	85.51 to 86.00	14.05
49.01 to 49.50	10.40	67.51 to 68.00	12.25	86.01 to 86.50	14.10
49.51 to 50.00	10.45	68.01 to 68.50	12.30	86.51 to 87.00	14.15
50.01 to 50.50	10.50	68.51 to 69.00	12.35	87.01 to 87.50	14.20
50.51 to 51.00	10.55	69.01 to 69.50	12.40	87.51 to 88.00	14.25
51.01 to 51.50	10.60	69.51 to 70.00	12.45	88.01 to 88.50	14.30
51.51 to 52.00	10.65	70.01 to 70.50	12.50	88.51 to 89.00	14.35
52.01 to 52.50	10.70	70.51 to 71.00	12.55	89.01 to 89.50	14.40
52.51 to 53.00	10.75	71.01 to 71.50	12.60	89.51 to 90.00	14.45
53.01 to 53.50	10.80	71.51 to 72.00	12.65	90.01 to 90.50	14.50
53.51 to 54.00	10.85	72.01 to 72.50	12.70	90.51 to 91.00	14.55
54.01 to 54.50	10.90	72.51 to 73.00	12.75	91.01 to 91.50	14.60
54.51 to 55.00	10.95	73.01 to 73.50	12.80	91.51 to 92.00	14.65
55.01 to 55.50	11.00	73.51 to 74.00	12.85	92.01 to 92.50	14.70
55.51 to 56.00	11.05	74.01 to 74.50	12.90	92.51 to 93.00	14.75
56.01 to 56.50	11.10	74.51 to 75.00	12.95	93.01 to 93.50	14.80
56.51 to 57.00	11.15	75.01 to 75.50	13.00	93.51 to 94.00	14.85
57.01 to 57.50	11.20	75.51 to 76.00	13.05	94.01 to 94.50	14.90
57.51 to 58.00	11.25	76.01 to 76.50	13.10	94.51 to 95.00	14.95
58.01 to 58.50	11.30	76.51 to 77.00	13.15	95.01 to 95.50	15.00
58.51 to 59.00	11.35	77.01 to 77.50	13.20	95.51 to 96.00	15.05
59.01 to 59.50	11.40	77.51 to 78.00	13.25	96.01 to 96.50	15.10
59.51 to 60.00	11.45	78.01 to 78.50	13.30	96.51 to 97.00	15.15
60.01 to 60.50	11.50	78.51 to 79.00	13.35	97.01 to 97.50	15.20
60.51 to 61.00	11.55	79.01 to 79.50	13.40	97.51 to 98.00	15.25
61.01 to 61.50	11.60	79.51 to 80.00	13.45	98.01 to 98.50	15.30
61.51 to 62.00	11.65	80.01 to 80.50	13.50	98.51 to 99.00	15.35
62.01 to 62.50	11.70	80.51 to 81.00	13.55	99.01 to 99.50	15.40
62.51 to 63.00	11.75	81.01 to 81.50	13.60	99.51 to 100.00	15.45
63.01 to 63.50	11.80	81.51 to 82.00	13.65	100.01 to 100.50	15.50

NOTE: In the event the average selling price as above defined rises above \$100.50, or falls below \$45.01, the above table will be extended at the rate of \$0.05 per animal unit month for each \$0.50 change in selling price above \$100.50 or below \$45.01, whichever the case may be.

Appendix F

Grazing Tenant Selection Process

I. District grazing licenses are subject to:

- A. All existing licenses, easements, rights-of-way, etc. of the license area;
- B. Primary rights of the public to use the license area in accordance with District regulations; and
- C. Primary right of the District to regulate livestock type, numbers, and season of use in accordance with District regulations and accepted principles of range management.

II. The District's Range Management Specialist shall reserve the authority to assign license areas to new or existing lessees if the following conditions apply:

- A. When it is determined that assigning a newly acquired or vacated property to an existing grazing lease would result in the improved overall management of both properties.
- B. When it is considered necessary to annex adjacent, open properties to existing license areas to relieve or more evenly distribute grazing pressure.
- C. When the District finds it prudent to enter into a license agreement with the incumbent long-term lessee of a newly acquired property who is able to meet the necessary eligibility criteria set by the District.

III. The following procedure will be applied in all other negotiations involving new grazing licenses for use of District lands, and to all licenses that are terminated and reopened to the selection process.

- A. The availability of a grazing license for use of District lands will be made known to interested parties through mailings, newspaper announcements and trade association newsletters.
- B. The announcement will describe the license area size, location, AUMs, existing and needed range improvements, and the type of operation desired by the District. Applicants will submit an operations proposal that will conform to the District's requirements.
- C. A selection committee composed of the following individuals will review all submitted proposals:
 - 1. The District's Range Management Specialist.
 - 2. The supervisor or Field Manager of the park in which the lease is located.
 - 3. A representative of the District's Range Management Technical Advisory Committee.
 - 4. A representative of an outside agency such as EBMUD or SFWD. If the District is leasing or otherwise managing the property from another agency, a representative of the agency owning the property shall fill this position.

- D. The committee shall meet and review all proposals and from them shall choose at least three final candidates. The District reserves the right to reopen the process if it does not receive an adequate number of responses, or if an inordinate number of the applicants who have responded fail to meet the selection criteria. The committee shall then set a date on which the final candidates will be interviewed. After the final selection is made, all unsuccessful candidates shall be notified of the outcome and the basis for the selection shall be given.

IV. In making the selection the committee shall take into consideration the following criteria:

A. Tenant Selection Criteria - General

1. demonstrated ability to undertake sound range and livestock management programs.
2. demonstrated financial solvency.
3. willingness to accomodate public use and to cooperate with the public.
4. ability to respond quickly to problems and emergencies (e.g., drought conditions, forage consumed by wildfire, livestock trespass, removing problem animals).

B. Tenant Selection Criteria - Specific

1. eligible applicants owning or operating a ranch in Alameda or Contra Costa counties who derive a primary source of their livelihood from livestock grazing will have preference over applicants who do not derive a primary source of their livelihood from livestock grazing.
2. an eligible applicant with access to alternative grazing land, which is available for use in conjunction with District lands will be preferred over any applicant unable to meet this requirement.
3. an eligible applicant who is recognized as the most logical applicant by virtue of controlling access, owning or using adjacent land, offering the use of range improvements found on adjacent land to benefit management of park land, etc., will be preferred over other applicants to utilize newly acquired or vacated range.

C. Tenant Selection Criteria - Special

1. if the lease area is adequately fenced but has no access, applicants must have legal access to the lease area.
2. if the lease area is not adequately fenced applicants may be required to:
 - a. construct appropriate fencing to contain livestock within the lease area; and/or
 - b. operate property adjacent to the lease area to allow passage of livestock between the two properties in lieu of a fence.

Appendix G

Range Analysis Process

Overview

The purpose of the range analysis process is to determine stocking rates for all park grazing units consistent with resource conservation objectives. The analysis provides a reasonably accurate estimate for determining the number of livestock an area can be expected to support in an average, favorable, and unfavorable rainfall

year. Where historical or current grazing records are available, the process is used to verify whether existing use levels are adequate, or whether adjustments are necessary. Where this information is unavailable, the analysis offers a reliable method for establishing an initial stocking rate.

Methodology

County Soil Surveys

Soil surveys are studies prepared for each County by the USDA Soil Conservation Service in cooperation with the University of California Agricultural Experiment Station. The surveys provide useful information about the kind, location, productivity, and suitability of soils for various engineering and agricultural uses, including livestock grazing.

Information contained within the soil surveys of Alameda and Contra Costa counties is used to determine forage production and stocking rates on EBRPD grazing lands. Soils are grouped into "range sites" on the basis of similarities in texture, depth, and slope. Forage production estimates for favorable and unfavorable rainfall years are provided in pounds per acre for each range site. This information is used in conjunction with field mapping data to determine forage production and stocking rate for a particular area.

Mapping Process

1. Aerial photographs included in the county soil surveys are used to identify the soil types found within a particular grazing unit. These soils are grouped into the appropriate range sites on a map overlay.

2. Vegetation types (e.g. grassland, oak woodland, chaparral, etc.) are identified and mapped in the field using aerial photographs and topographical maps. Terrain features, restricted areas, and ponds and springs are also noted during the mapping process. Rock outcrops and excessively steep slopes limit livestock accessibility. Areas of high recreation use, wetlands, and sites containing notable resources may require exclusion from livestock use. The availability of water also has an effect on livestock distribution patterns.

3. Vegetation types identified in the field are overlaid onto the range site maps to determine the number of acres each type occupies within a particular range site. Consideration is given to the fact that forage production varies within different vegetation types. Forage production in open grassland is generally higher than in grazable woodland and shrubland communities. Woodlands with sparse understory vegetation (e.g. oak/bay woodland, eucalyptus forest), and dense shrublands have little or no forage value. This information is taken into account when calculating total forage production for an area.

Calculations and Adjustments

1. A digital planimeter is used to determine the number of acres each vegetation type occupies

within a given range site. Areas that afford little or no forage value are subtracted from the total acreage. Forage production in pounds per acre is calculated by multiplying forage production figures from the County soil survey by the acreage of each useable vegetation type occurring on the unit. Adjustment factors compensate for relative variations in forage production on the different vegetation types. This process provides an estimate of the total amount of forage produced on the unit in an average, favorable, and unfavorable rainfall year.

2. Residual dry matter (RDM) standards are used to determine the amount of each year's vegetative production that should remain on the ground at the end of the grazing season. This residue or mulch acts as a protective layer over the soil to guard against erosion, encourage nutrient recycling, and promote optimum conditions for plant growth. For this part of California, the RDM levels are:

- 0 to 30% slope: leave 600 lbs./acre
- 30 to 50% slope: leave 800 lbs./acre
- greater than 50% slope: leave 1000 lbs./acre

Another acceptable method of determining forage utilization on annual grasslands is to establish a percentage of the total forage production that livestock can use in a given grazing season. Like RDM standards, percent utilization is used to determine when acceptable use levels have been achieved. A 60 percent level of forage utilization has been established for park land (i.e. 60% of total vegetative production is used by livestock, 40% is left on the ground).

To insure proper utilization, both RDM and percent utilization are given consideration in the analysis process. The larger of these two adjustment values is subtracted from the estimated total forage production figures for each range site to determine the amount of forage available for livestock use.

3. The EBRPD has prepared a master inventory containing a listing of all range sites found within Alameda and Contra Costa counties. Corresponding forage production figures are included for each range site, and adjustment factors are used to calculate available forage production. This information is incorporated into a computer program that generates stocking rate estimates for a given area of land, as well as other useful data.

Final Product

The computer produces a four page report which provides the following information:

- total acreage of each range site occurring on the unit
- total acreage each vegetation type occupies within a given range site
- total acreage for each vegetation type
- total acreage available for livestock use
- available forage production in pounds per acre for each range site
- total available forage production in pounds per acre on the unit

- the corresponding number of animal units that the land can adequately support in an average, favorable (wet), and unfavorable (drought) rainfall year.

Once a stocking rate has been established, use levels can be changed to reflect existing conditions. Additional adjustments may be necessary in situations where steep terrain and/or the lack of available drinking water limit or preclude grazing use on certain areas of the range.

The range manager conducts periodic inspections of the range during the grazing season to determine if grazing use needs to be modified to insure that proper utilization is achieved.

Appendix H

List of Rare, Threatened and Endangered Plants

<i>Scientific Name</i> Common Name	Federal Status	State Status	CNPS Status	Habitat Type	Distribution by Park
<i>Acanthomintha lanceolata</i> Santa Clara thorn mint	None	None	1-1-3 List 4	Chaparral (shale scree)	O S
<i>Amsinckia grandiflora</i> Large-flowered fiddleneck	FE	CE	3-3-3 List 1B	Annual grassland Oak woodland	Bd
<i>Arctostaphylos auriculata</i> Mt. Diablo manzanita	C3c	None	3-1-3 List 1B	Chaparral	Bd
<i>Arctostaphylos pallida</i> Alameda manzanita	C2	CE	3-3-3 List 1B	Chaparral	H Sr T
<i>Aster chilensis</i> var. <i>lentus</i> Suisun marsh aster	C2	None	2-2-3 List 1B	Marshes & swamps (brackish)	Bi
<i>Calochortus pulchellus</i> Mt. Diablo fairy lantern	None	None	1-1-3 List 4	Chaparral Oak woodland	B Df Dv Mt
<i>Calochortus umbellatus</i> Oakland star-tulip	None	None	1-1-3 List 4	Chaparral	Ac Lt O T W
<i>Clarkia franciscana</i> Presidio clarkia	C1	CE	3-3-3 List 1B	Coastal scrub	Ac R T
<i>Cordylanthus mollis</i> ssp. <i>mollis</i> Soft bird's-beak	C2	None	2-3-3 List 1B	Marshes & swamps (coastal salt)	Pp
<i>Dirca occidentalis</i> Western leatherwood	None	None	1-2-3 List 4	Chaparral, Mixed evergreen forest	Ac Cc H L R T W
<i>Eriogonum caninum</i> Tiburon buckwheat	C3c	None	1-2-3 List 4	Annual grassland Chaparral	R
<i>Erysimum capitatum</i> var. <i>angustatum</i> Contra Costa wallflower	FE	CE	3-3-3 List 1B	Inland dunes	Bi
<i>Fritillaria liliacea</i> Fragrant fritillary	C2	None	1-2-3 List 1B	Annual grassland Coastal scrub	Df T
<i>Helianthella castanea</i> Diablo helianthella	C2	None	3-2-3 List 1B	Chaparral, Mixed evergreen forest	Ac Bd Cs Lt Mt
<i>Hesperolinon breweri</i> Brewer's dwarf flax	C2	None	3-2-3 List 1B	Annual grassland Chaparral	Bd
<i>Holocarpha macradenia</i> Santa Cruz tarplant	C1	CE	2-3-3 List 1B	Annual grassland	W (introduced)
<i>Juglans hindsii</i> Northern California black walnut	C2	None	3-3-3 List 1B	Riparian forest Riparian woodland	Lt

<i>Scientific Name</i> Common Name	Federal Status	State Status	CNPS Status	Habitat Type	Distribution by Park
<i>Lathyrus jepsonii</i> ssp. <i>jepsonii</i> Delta tule pea	C2	None	2-2-3 List 1B	Marshes & swamps (brackish)	Bi Mw
<i>Lilaeopsis masonii</i> Mason's lilaeopsis	C2	CR	2-2-3 List 1B	Marshes & swamps (brackish)	Bi
<i>Malacothamnus hallii</i> Hall's bush mallow	None	None	1-1-3 List 4	Chaparral	Bd
<i>Oenothera deltoides</i> ssp. <i>howellii</i> Antioch Dunes evening primrose	FE	CE	3-3-3 List 1B	Inland dunes	Bi
<i>Quercus lobata</i> Valley oak	None	None	1-2-3 List 4	Oak woodland Riparian Forest	Widespread
<i>Ranunculus lobbii</i> Lobb's aquatic buttercup	None	None	1-2-3 List 4	Grassland Oak woodland	Wildcat Canyon

Abbreviations Used

Federal Status

C1 = Enough data are on file to support the federal listing
C2 = Threat and/or distribution data are insufficient to support federal listing
C3c = Too widespread and/or not threatened
FE = Federally listed, endangered

State Status

CE = State listed, endangered
CR = State listed, rare

CNPS Status (R-E-D, List)

CNPS = California Native Plant Society

R (Rarity)

1- Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time
2- Occurrence confined to several populations or to one extended population
3- Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported

E (Endangerment)

1- Not endangered
2- Endangered in a portion of its range
3- Endangered throughout its range

D (Distribution)

1- More or less widespread outside California
2- Rare outside California
3- Endemic to California

List 1B

Plants that are rare or endangered in California and elsewhere

List 4

Plants of Limited Distribution (a Watch List)

Distribution by Park

Ac	Anthony Chabot
B	Briones
Bd	Black Diamond Mines
Bi	Brown's Island
Cc	Claremont Canyon
Cs	Carquinez Straits
Df	Diablo Foothills
Dv	Del Valle
H	Huckleberry
L	Leona
Lt	Las Trampas
Mt	Morgan Territory
Mw	Martinez Waterfront
O	Ohlone
Pp	Point Pinole
R	Redwood
Ro	Roberts
S	Sunol
Sr	Sobrante Ridge
T	Tilden
W	Wildcat Canyon

Appendix I

EBRPD Rangeland Plant Inventory

Key to Abbreviations

Vegcode: 1st two letters of the genus, 1st two letters of the species, 1st letter of the variety (if present), number (if the letter combination is not unique).

Munz: Page number in: Munz, P.A. and D.D. Keck. 1973. A California Flora, combined ed. University of California Press, Berkeley. An "s" preceding the page number indicates an entry in the supplement section.

Family: Contemporary names (with an "aceae" ending) are used for all families. Some contemporary name spellings and the traditional equivalents are listed below:

Contemporary	Traditional	Common Name
Apiaceae	Umbelliferae	Carrot Family
Asteraceae	Compositae	Sunflower Family
Brassicaceae	Cruciferae	Mustard Family
Fabaceae	Leguminosae	Pea Family
Lamiaceae	Labiatae	Mint Family
Poaceae	Gramineae	Grass Family

Strata: F = Fern
G = Grass or Grasslike
S = Shrub
T = Tree

E-Range: Elevation range, in feet, for each species in California (based on Munz). If the maximum elevation range is unknown, the estimate ends with the digit "1" (e.g. 5001 = estimated at 5000 ft. or higher).

Vegtype: Plant community type(s) in which the plant is usually found (based on Munz and personal observation).

C = Chaparral
E = mixed Evergreen forest
F = Freshwater marsh
G = Grassland (valley grassland in Munz)
O = Oak woodland (foothill woodland in Munz)
R = Redwood forest
S = Scrub, brush (coastal sage scrub in Munz)
W = riparian Woodland (found along drainages, not a specific community in Munz)

NI: I = Introduced
N = Native

L (Longevity): A = Annual
AB = Annual or Biennial
AP = Annual or Perennial
B = Biennial
P = Perennial

EBRPD Rangeland Plant Inventory

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Trees										
Acer	macrophyllum		ACMA	996	BIG-LEAF MAPLE	Aceraceae	T	0 5000	OR W	NP
Acer	negundo	californicum	ACNEC	996	BOX ELDER	Aceraceae	T	0 6000	O W	NP
Aesculus	californica		AECA2	994	CALIFORNIA BUCKEYE	Anacardiaceae	T	0 4000	E O S	NP
Alnus	oregona		ALOR	900	RED ALDER	Betulaceae	T	0 500	F W	NP
Alnus	rhombifolia		ALRH	900	WHITE ALDER	Betulaceae	T	0 5000	R W	NP
Arbutus	menziesii		ARME3	415	MADRONE	Ericaceae	T	0 5000	E OR	NP
Castanopsis	chrysophylla		CACH2	901	GIANT CHINQUAPIN	Fagaceae	T	0 1500	E R	NP
Cornus	nuttallii		CONU2	1035	MOUNTAIN DOGWOOD	Cornaceae	T	0 6000	E	W NP
Eucalyptus	globulus		EUGL2	963	BLUE GUM	Myrtaceae	T	0 4001	E	IP
Fraxinus	latifolia		FRLA2	447	OREGON ASH	Oleaceae	T	0 5500		W NP
Juglans	hindsii		JUHI	909	CALIFORNIA BLACK WALNUT	Juglandaceae	T	0 2500	O	NP
Juniperus	californica		JUCA3	63	CALIFORNIA JUNIPER	Cupressaceae	T	0 5000	CE O	NP
Lithocarpus	densiflorus		LIDE2	a121	TANOAK	Fagaceae	T	0 4500	E R	NP
Nicotiana	glauca		NIGL	602	TREE TOBACCO	Solanaceae	T	0 3000	GO S	IP
Olea	europaea				OLIVE	Oleaceae	T	0 3001	O	IP
Pinus	attenuata		PIAT1	54	KNOB-CONE PINE	Pinaceae	T	0 4000	R	NP
Pinus	coulteri		PICO2	55	COULTER PINE	Pinaceae	T	750 7000	O	NP
Pinus	radiata		PIRA	54	MONTEREY PINE	Pinaceae	T	0 1000	E	NP
Pinus	sabiniana		PISA2	55	DIGGER PINE	Pinaceae	T	0 4500	O	NP
Platanus	racemosa		PLRA	897	WESTERN SYCAMORE	Platanaceae	T	0 4000	R W	NP
Populus	fremontii		POFR3	910	FREMONT COTTONWOOD	Salicaceae	T	0 6500		W NP
Populus	trichocarpa		POTR4	910	BLACK COTTONWOOD	Salicaceae	T	0 9000		W NP
Prunus	ilicifolia		PRIL2	790	HOLLY-LEAVED CHERRY	Rosaceae	T	0 5000	C O	NP
Pseudotsuga	menziesii		PSME	57	DOUGLAS FIR	Pinaceae	T	0 5000	E R	NP
Quercus	agrifolia		QUAG	904	COAST LIVE OAK	Fagaceae	T	0 3000	E O	NP
Quercus	chasei		QUCH1	904	CHASE OAK	Fagaceae	T	1000 3000	E O	NP
Quercus	chrysolepis		QUCH2	906	CANYON or MAUL OAK	Fagaceae	T	0 6500	CE OR	NP
Quercus	douglasii		QUDO	905	BLUE OAK	Fagaceae	T	0 3500	O	NP
Quercus	dumosa		QUDU4	905	CALIFORNIA SCRUB OAK	Fagaceae	T	0 5000	C O	NP
Quercus	garryana		QUGA2	904	GARRY or OREGON OAK	Fagaceae	T	1000 5000	E R	NP
Quercus	kelloogii		QUKE	903	CALIFORNIA BLACK OAK	Fagaceae	T	500 8000	E OR	NP
Quercus	lobata		QULO	904	VALLEY OAK	Fagaceae	T	0 2000	O	NE
Quercus	morehus		QUMO	903	ORACLE OAK	Fagaceae	T	0 5000	E O	NP
Quercus	wislizenii		QUWI	903	INTERIOR LIVE OAK	Fagaceae	T	0 5000	C O	NP
Salix	babylonica		SABA	a121	WEeping WILLOW	Salicaceae	T	0 3001		W IP
Salix	lasianhra		SALA5	917	YELLOW WILLOW	Salicaceae	T	0 8000		W NP
Sequoia	sempervirens		SESE2	57	COAST REDWOOD	Taxodiaceae	T	0 2000	R	NP
Torreya	californica		TOCA	65	CALIFORNIA NUTMEG	Taxaceae	T	0 4500	E	NP
Umbellularia	californica		UMCA1	77	BAY LAUREL	Lauraceae	T	0 5000	E OR	NP
Shrubs										
Adenostoma	fasciculatum		ADFA	778	CHAMISE	Rosaceae	S	0 5000	C GO S	NP
Aesculus	californica		AECA1	994	CALIFORNIA BUCKEYE	Sapindaceae	S	0 4000	E O S	NP
Amelanchier	pallida		AMPA2	793	SERVICE BERRY	Rosaceae	S	0 11000	E O S	NP
Amorpha	californica	napensis	AMCAN	852	FALSE INDIGO	Fabaceae	S	0 7500	C	NP
Arctostaphylos	andersonii	pallida	ARANP	427	ALAMEDA MANZANITA	Ericaceae	S	0 2200	C	NP
Arctostaphylos	auriculata		ARAU	426	MOUNT DIABLO MANZANITA	Ericaceae	S	500 2000	C	NP
Arctostaphylos	crustacea		ARCR	429	BRITTLELEAF MANZANITA	Ericaceae	S	0 3400	C	NP
Arctostaphylos	glandulosa		ARGL4	428	EASTWOOD MANZANITA	Ericaceae	S	1000 6000	CE	NP
Arctostaphylos	glandulosa	cushingiana	ARGLC3	428	CUSHING MANZANITA	Ericaceae	S	0 2500	C	NP
Arctostaphylos	glauca		ARGL5	424	GREAT-BERRIED MANZANITA	Ericaceae	S	0 4500	C	NP
Arctostaphylos	manzanita		ARMA3	422	PARRY MANZANITA	Ericaceae	S	300 4000	C O	NP
Aristolochia	californica		ARCA6	966	DUTCHMAN'S PIPE	Aristolochiaceae	S	0 1500	CE O	NP
Artemisia	californica		ARCA7	1236	CALIFORNIA SAGEBRUSH	Asteraceae	S	0 2500	E	S NP
Baccharis	douglasii		BADO	1225	SALT MARSH BACCHARIS	Asteraceae	S	0 1500		W NP
Baccharis	pilularis	consanguinea	BAPIC	1226	COYOTE BRUSH	Asteraceae	E	0 2000	CE GORS	NP
Baccharis	viminea		BAVI	1226	MULE FAT	Asteraceae	S	0 1500	O S	NP
Berberis	nervosa		BENE1	109	DWARF OREGON GRAPE	Berberidaceae	S	0 6000	R	NP
Berberis	pinnata		BEPI1	109	CALIFORNIA BARBERRY	Berberidaceae	S	0 4000	E R	NP
Brickellia	californica		BRCA5	1270	SWEET-SCENTED BRICKELLIA	Asteraceae	S	0 8000	C	S NP
Castanopsis	chrysophylla	minor	CACHM	901	GOLDEN CHINQUAPIN	Fagaceae	S	1000 6000	CE	NP
Castilleja	foliolosa		CAFO2	671	WOOLLY PAINTED CUP	Scrophulariaceae	S	0 5000	CE GO S	NP
Ceanothus	cuneatus		CECU2	982	BUCK BRUSH	Rhamnaceae	S	0 6000	C	NP
Ceanothus	sorediatus		CESO3	977	JIM BRUSH	Rhamnaceae	S	0 3500	CE O	NP
Ceanothus	thyrsiflorus		CETH	979	BLUE BRUSH	Rhamnaceae	S	0 2000	CE RS	NP
Cercocarpus	betuloides		CEBE2	781	WESTERN MT. MAHOGANY	Rosaceae	S	0 6000	C O	NP
Cornus	glabrata		COGL	1034	BROWN DOGWOOD	Cornaceae	S	0 5000		W NP
Cornus	occidentalis		COOC2	1035	CREEK DOGWOOD	Cornaceae	S	0 8000	E O SW	NP
Corylus	cornuta	californica	COCOC	899	CALIFORNIA HAZELNUT	Betulaceae	S	0 7000	E ORS	NP
Cytisus	monspessulanus		CYMO2	830	FRENCH BROOM	Fabaceae	S	0 2001	CE GO S	IP
Cytisus	scoparius		CYSC2	830	SCOTCH BROOM	Fabaceae	S	0 2001	CE GO S	IP
Diplacus	aurantiacus		DIAU1	624	BUSH MONKEY-FLOWER	Scrophulariaceae	S	0 3000	CE RS	NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Dirca	occidentalis		DIOC3	987	WESTERN LEATHERWOOD	Thymelaeaceae	S	0 1500 CE		NP
Eriodictyon	californicum		ERCA6	548	YERBA SANTA	Hydrophyllaceae	S	0 5500 CE	OR	NP
Eriophyllum	confertiflorum		ERCO7	1149	GOLDEN YARROW	Asteraceae	S	0 8000 C	S	NP
Eriophyllum	jepsonii		ERJE	1148	JEPSON ERIOPHYLLUM	Asteraceae	S	1000 3500	O	NP
Forestiera	neomexicana		FONE1	448	DESERT OLIVE	Oleaceae	S	0 6700 C	O S	NP
Fraxinus	dipetala		FRDI	447	FOOTHILL ASH	Oleaceae	S	0 3500 C	O	NP
Garrya	elliptica		GAEL	1037	SILK TASSEL BUSH	Garryaceae	S	0 2000 CE	S	NP
Garrya	fremontii		GAFR	1036	BEAR BUSH	Garryaceae	S	0 7500 CE		NP
Gaultheria	shallon		GASH	415	SALAL	Ericaceae	S	0 2500 E	RS	NP
Gutierrezia	californica		GUCA	1167	CALIFORNIA SNAKEWEED	Asteraceae	S	0 1000 C	GO	NP
Haplopappus	arborescens		HAAR	1183	GOLDEN FLEECE	Asteraceae	S	300 4000 C	O	NP
Haplopappus	linearifolius		HALI	1180		Asteraceae	S	0 6000 C	S	NP
Helianthemum	scoparium	vulgare	HESCV	173	RUSH-ROSE	Cistaceae	S	0 4000 C		NP
Helianthus	gracilentus		HEGR3	1089	CHAPARRAL SUNFLOWER	Asteraceae	S	200 6000 C		NP
Heteromeles	arbutifolia		HEAR2	794	CHRISTMAS BERRY or TOYON	Rosaceae	S	0 4000 CE	O S	NP
Holodiscus	discolor		HODI	759	CREAM BUSH or OCEAN SPRAY	Rosaceae	S	0 4500 CE	RS	NP
Lepachnia	calycina		LECA3	707	PITCHER SAGE	Lamiaceae	S	0 3000 C	O	NP
Lonicera	hispidula	vacillans	LOHIV	1051	CALIFORNIA HONEYSUCKLE	Caprifoliaceae	S	0 2500 E	RS	NP
Lonicera	interrupta		LOIN3	1051	CHAPARRAL HONEYSUCKLE	Caprifoliaceae	S	1000 6000 C	O	NP
Lonicera	involucrata	ledebourii	LOINL	1050	TWIN-BERRY	Caprifoliaceae	S	0 1000	S	NP
Lonicera	subspicata	johnstonii	LOSUJ	1051	MORONEL or S. HONEYSUCKLE	Caprifoliaceae	S	0 3000 C		NP
Lupinus	albifrons		LUAL3	823	SILVER BUSH LUPINE	Fabaceae	S	0 5000 CE	S	NP
Malacothamnus	fasciculatus		MAFA2	126	MESA MALLOW	Malvaceae	S	0 2500 C	S	NP
Malacothamnus	fremontii		MAFR	124	WHITE COAT MALLOW	Malvaceae	S	200 3500 C	O	NP
Myrica	californica		MYCA	908	CALIFORNIA WAX-MYRTLE	Myricaceae	S	0 500	RS	NP
Nicotiana	glauca		NIGL	602	TREE TOBACCO	Solanaceae	S	0 3000	GO S	IP
Olea	europaea				OLIVE	Oleaceae	S	0 3001	O	IP
Osmaronia	cerasiformis		OSCE	791	OSO BERRY	Rosaceae	S	0 5600 CE	RS	NP
Penstemon	corymbosus		PECO4	641	ROCK PENSTEMON	Scrophulariaceae	S	0 5000 E	R	NP
Phyocarpus	capitatus		PHCA8	757	PACIFIC NINEBARK	Rosaceae	S	0 4500 E	OR W	NP
Pickeringia	montana		PIMO1	803	CHAPARRAL PEA	Fabaceae	S	0 5000 CE		NP
Prunus	emarginata		PREM	789	BITTER CHERRY	Rosaceae	S	0 4000 C		NP
Prunus	ilicifolia		PRIL1	790	HOLLY-LEAVED CHERRY	Rosaceae	S	0 5000 C	O	NP
Prunus	subcordata		PRSU2	789	SIERRA PLUM	Rosaceae	S	0 6000 E		NP
Prunus	virginiana	demissa	PRVID	790	WESTERN CHOKE-CHERRY	Rosaceae	S	0 8200 C	O	NP
Ptelea	crenulata		PTCR	992	BOP TREE	Rutaceae	S	0 3500	O S	NP
Quercus	dumosa		QUDU2	905	CALIFORNIA SCRUB OAK	Fagaceae	S	0 5000 C	O	NP
Quercus	durata		QUDU1	906	LEATHER OAK	Fagaceae	S	0 5000 C	O	NP
Quercus	wislizenii	frutescens	QUWIF	904	SHRUB INTERIOR LIVE OAK	Fagaceae	S	500 5001 C		NP
Rhamnus	californica		RHCA2	972	CALIFORNIA COFFEE-BERRY	Rhamnaceae	S	0 3500 CE	RS	NP
Rhamnus	crocea		RHCR	972	RED-BERRY	Rhamnaceae	S	0 3000 CE	O S	NP
Rhamnus	crocea	ilicifolia	RHCRI	971	RED-BERRY	Rhamnaceae	S	0 5000 CE	O	NP
Rhus	diversiloba		RHDI	998	POISON OAK	Anacardiaceae	S	0 5000	GORSW	NP
Rhus	trilobata	malacophylla	RHTRM	998	SQUAW BUSH	Anacardiaceae	S	0 3500 C	O S	NP
Rhus	trilobata	quinata	RHTRQ	998	SQUAW BUSH	Anacardiaceae	S	0 3500 C	O S	NP
Ribes	californicum		RICA1	752	HILL GOOSEBERRY	Saxifragaceae	S	0 2500 CE	OR	NP
Ribes	malvaceum		RIMA1	749	CALIFORNIA BLACK CURRANT	Saxifragaceae	S	0 2500 C	O	NP
Ribes	menziesii		RIME	752	CANYON GOOSEBERRY	Saxifragaceae	S	0 1000 E	R	NP
Ribes	sanguineum	glutinosum	RISAG	749	RED-FLOWERING CURRANT	Saxifragaceae	S	0 2000 CE	OR	NP
Rosa	californica		ROCA1	787	CALIFORNIA ROSE	Rosaceae	S	0 6000 CE	ORS	NP
Rosa	gymnocarpa		ROGY	788	WOOD ROSE	Rosaceae	S	0 6000 CE	ORS	NP
Rosa	spithamea	sonomensis	ROSPS	787	SONOMA ROSE	Rosaceae	S	0 4000 CE		NP
Rubus	parviflorus		RUPA	785	THIMBLE-BERRY	Rosaceae	S	0 8000 E	R	NP
Rubus	procerus		RUPR	784	HIMALAYA-BERRY	Rosaceae	S	0 4001 E	RS	IP
Rubus	urens		RUUR	784	CALIFORNIA BLACKBERRY	Rosaceae	S	0 3000 E	RS	NP
Rubus	vitifolius		RUVI2	783	COAST CALIF. BLACKBERRY	Rosaceae	S	0 4000 E	GO W	NP
Salix	coulteri		SACO3	917	COULTER WILLOW	Salicaceae	S	0 2000 E	R W	NP
Salix	hindsiana		SAHI2	913	SANDBAR WILLOW	Salicaceae	S	0 3000 E	ORSW	NP
Salix	laevigata		SALA4	913	RED WILLOW	Salicaceae	S	0 5000 E	RSW	NP
Salix	lasiolepis		SALA3	915	ARROYO WILLOW	Salicaceae	S	0 7000 E	ORSW	NP
Salvia	mellifera		SAME4	705	BLACK SAGE	Lamiaceae	S	0 2000 C	S	NP
Sambucus	caerulea		SACA4	1047	BLUE ELDERBERRY	Caprifoliaceae	S	0 10000 CE	O S	NP
Sambucus	callicarpa		SACA3	1047	PACIFIC RED ELDERBERRY	Caprifoliaceae	S	0 1000 E	R W	NP
Solanum	umbelliferum		SOMU	598	BLUE WITCH	Solanaceae	S	0 2500 CE	S	NP
Solanum	umbelliferum	incanum	SOMUI	598	BLUE WITCH	Solanaceae	S	0 4500 C	GO	NP
Symphoricarpos	mollis		SYMO	1049	CREeping SNOWBERRY	Caprifoliaceae	S	0 5000 CE	O	NP
Symphoricarpos	rivularis		SYRI	1049	COMMON SNOWBERRY	Caprifoliaceae	S	0 4000 E	ORS	NP
Umbellularia	californica		UMCA2	77	BAY LAUREL	Lauraceae	S	0 5000 E	OR	NP
Vaccinium	ovatum		VAOV	430	CALIFORNIA HUCKLEBERRY	Ericaceae	S	0 2500 E	R	NP
Viburnum	ellipticum		VIEL	1048	WESTERN VIBURNUM	Caprifoliaceae	S	1000 4500 C		NP
Vitis	californica		VICA3	969	CALIFORNIA GRAPE	Vitaceae	S	0 4000 E	O	NP

Herbs

Achillea	borealis	californica	ACBOC	1229	COMMON YARROW	Asteraceae	H	0 2500 E	GORS	NP
Achillea	millefolium		ACMI	1228	MILFOIL	Asteraceae	H	0 5001	GO S	IP
Achyrrachaena	mollis		ACHMO	1107	BLOW-WIVES	Asteraceae	H	0 1000	GO	NA
Agoseris	grandiflora		AGGR1	1293		Asteraceae	H	0 6200	GO	NP
Agoseris	heterophylla		AGHE	1292		Asteraceae	H	0 7500	GO	NA
Agoseris	retroscia		AGRE2	1293		Asteraceae	H	2500 8000 C	GO	NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Alchemilla	occidentalis		ALOC1	777	WESTERN LADY'S MANTLE	Rosaceae	H	0 2000	E GO	NA
Alisma	triviale		ALTR1	1314	WATER PLANTAIN	Alismataceae	H	0 5000		W NP
Allium	acuminatum		ALAC	1378	HOOKER ONION	Liliaceae	H	0 6000 C		NP
Allium	falcifolium		ALFA	1372	SICKLE-LEAVED ONION	Liliaceae	H	500 7000 CE	O	NP
Allium	serratum		ALSE	1374	SERRATUM ONION	Liliaceae	H	0 3000	GO	NP
Allium	unifolium		ALUN	1373	COLONIAL ONION	Liliaceae	H	0 3500 CE		NP
Allophyllum	gilioideis		ALGI	472		Polemoniaceae	H	0 6000 C	GO	NA
Amaranthus	albus		AMAL	387	TUMBLEWEED	Amaranthaceae	H	0 5001 CE	GO S	IA
Amaranthus	californicus		AMCA1	387	CALIFORNIA AMARANTH	Amaranthaceae	H	0 8000 C	GO	NA
Amaranthus	retroflexus		AMRE	386	ROUGH FIGWEED	Amaranthaceae	H	0 5001 CE	GO S	IA
Amsinckia	intermedia		AMIN	589	COMMON FIDDLENECK	Boraginaceae	H	0 5000	GO	NA
Amsinckia	tessellata		AMTE	588	COBBLESTONE FIDDLENECK	Boraginaceae	H	0 6000	GO	NA
Anagallis	arvensis		ANAR2	404	SCARLET PIMPERNEL	Primulaceae	H	0 4001 CE	GORS	IA
Anaphalis	margaritacea		ANMA1	1263	PEARLY EVERLASTING	Asteraceae	H	0 8500 E	RS	IP
Androsace	elongata	acuta	ANEA	399		Primulaceae	H	0 4000 C	GO S	NA
Anemopsis	californica		ANCA	114	YERBA MANSA	Saururaceae	H	0 6500		W NP
Angelica	tomentosa		ANTO	1028	WOOD ANGELICA	Apiaceae	H	0 7000 C		NP
Anthemis	cotula		ANCO2	1228	MAYWEED	Asteraceae	H	0 5001 CE	GORS	IA
Anthriscus	neglecta	scandix	ANNES	1138	BUR CHERVIL	Apiaceae	H	0 5001 CE	GORS	IA
Antirrhinum	kellooggii		ANKE	652	HOOKEP SNAPDRAGON	Scrophulariaceae	H	0 2000 C		S NA
Antirrhinum	vexillo-calyculatum		ANVE	651	WIRY SNAPDRAGON	Scrophulariaceae	H	0 4000 C		S NA
Apiastrum	angustifolium		APAN1	1006	MOCK PARSLEY	Apiaceae	H	0 3000 C	GO S	NA
Apocynum	cannabinum	glaberrimum	APCAG	451	INDIAN HEMP	Apocynaceae	H	0 5000 CE	GORS	NP
Apocynum	pumilum		APPU	451	MOUNTAIN HEMP	Apocynaceae	H	2500 5500 E	RS	NP
Aquilegia	eximia		AQEX	105	STREAM COLUMBINE	Ranunculaceae	H	0 6000		W NP
Aquilegia	formosa	truncata	AQFOT	105	CRIMSON COLUMBINE	Ranunculaceae	H	0 8000 E	RS	NP
Arabis	breweri		ARBR	262	BREWER ROCK CRESS	Brassicaceae	H	1500 7400	O	NP
Arabis	glabra		ARGL2	258	TOWER MUSTARD	Brassicaceae	H	0 7000 CE	GORS	NP
Aralia	californica		ARCA2	1000	ELK CLOVER	Araliaceae	H	0 5000 E	ORS	NP
Arceuthobium	campylopodum		ARCA10	990	PINE MISTLETOE	Viscaceae	H	0 5001 E	O	NP
Arenaria	douglasii		ARDO2	279	DOUGLAS SANDWORT	Caryophyllaceae	H	0 7000 C	GO	NA
Arenaria	macrophylla		ARMA1	282		Caryophyllaceae	H	15 6500 E		NP
Argemone	munita	rotundata	ARMUR2	200	THISTLE-POPPY / CHICALOTE	Papaveraceae	H	12 3200 C		NP
Arnica	discoidea		ARDI3	1243	COAST ARNICA	Asteraceae	H	1500 6000 E		NP
Arnica	discoidea	alata	ARDIA	1243	COAST ARNICA	Asteraceae	H	1500 6000 E		NP
Arnica	discoidea	eradiata	ARDIE	1243	COAST ARNICA	Asteraceae	H	1500 6000 E		NP
Artemisia	douglasiana		ARDO3	1237	CALIFORNIA MUGWORT	Asteraceae	H	0 6000 CE	ORS	NP
Asclepias	californica		ASCA3	455	ROUND-HOOD MILKWEED	Asclepiadaceae	H	0 7500 C	O	NP
Asclepias	californica	greenesii	ASGAC	455	ROUND-HOOD MILKWEED	Asclepiadaceae	H	0 3500 C	O	NP
Asclepias	fascicularis		ASFA	456	NARROW-LEAF MILKWEED	Asclepiadaceae	H	0 7000 C	GO S	NP
Asclepias	speciosa		ASSP1	455	SHOWY MILKWEED	Asclepiadaceae	H	0 6000 E	O	NP
Aster	radulinus		ASRA1	1197	BROAD-LEAF ASTER	Asteraceae	H	300 5000 E	O S	NP
Astragalus	asymmetricus		ASAS2	878	ASYMMETRICAL LOCO	Fabaceae	H	200 2500	GO	NP
Astragalus	gambelianus		ASGA	864	LITTLE BILL LOCO	Fabaceae	H	0 4000	GO S	NA
Athysanus	pusillus		ATPU1	253	SANDWEED	Brassicaceae	H	0 5000 C	GO S	NA
Baccharis	douglasii		BADO	1225		Asteraceae	H	0 1500		W NP
Barbarea	orthoceras	dolichocarpa	BAORD	238	WINTER CRESS	Brassicaceae	H	1001 11000		W NP
Bellardia	trixago		BETR	657		Scrophulariaceae	H	0 4001 E	GO S	IA
Berula	erecta		BEER	1011	CUT-LEAVED WATER PARSNIP	Apiaceae	H	0 8000		W NP
Blennosperma	nanum		BLNA	1159	COMMON BLENNOSPERMA	Asteraceae	H	0 1500	GO	NA
Boisdualia	densiflora		BODE	933		Onagraceae	H	0 8500		W NA
Boisdualia	glabella		BOGL	934		Onagraceae	H	0 5000		W NA
Boisdualia	stricta		BOST1	934		Onagraceae	H	0 8500		W NA
Bowlesia	incana		BOIN	1004	BOWLESIA	Apiaceae	H	0 2500	O S	NA
Boykinia	elata		BOEL	732	COAST BOYKINIA	Saxifragaceae	H	0 5000 E	RSW	NP
Brassica	campestris		BRCA3	236	COMMON YELLOW MUSTARD	Brassicaceae	H	0 5001 CE	GORS	IA
Brassica	geniculata		BRGE	236	LATE MUSTARD	Brassicaceae	H	0 5001	GO	IBF
Brassica	kaber	pinnatifida	BRKAP	237	CHARLOCK	Brassicaceae	H	0 5001 CE	GORS	IA
Brassica	nigra		BRN1	236	BLACK MUSTARD	Brassicaceae	H	0 5001 CE	GORS	IA
Brodiaea	elegans		BREL	1383	HARVEST BRODIAEA	Liliaceae	H	0 7000	GO	NP
Brodiaea	hyacinthina		BRHY	1383	WHITE BRODIAEA	Liliaceae	H	0 5500	GO	W NP
Brodiaea	laxa		BRIA2	1381	ITHURIEL'S SPEAR	Liliaceae	H	0 4600 CE	GO	NP
Brodiaea	pulchella		BRPU	1385	BLUE DICKS	Liliaceae	H	0 5001 E	GO S	NP
Calandrinia	breweri		CABR7	299		Portulacaceae	H	0 3500 C		S NA
Calandrinia	ciliata	menziesii	CACIM	299	RED MAIDS	Portulacaceae	H	0 6000	GO	NA
Calochortus	albus		CAAL4	1346	GLOBE LILY	Liliaceae	H	0 5000 C	O	NP
Calochortus	luteus		CALU3	1351	YELLOW MARIPOSA LILY	Liliaceae	H	0 2000 E	GO	NP
Calochortus	pulchellus		CAPU2	1347	FAIRY LANTERN	Liliaceae	H	700 4000 C	O	NP
Calochortus	splendens		CASP4	1350	LILAC MARIPOSA	Liliaceae	H	0 6000 C	GO	NP
Calochortus	superbus		CASU4	1351	SUPERE MARIPOSA LILY	Liliaceae	H	0 5000	GO	NP
Calochortus	umbellatus		CAUM1	1348	STAR TULIP	Liliaceae	H	1000 2200 CE		NP
Calochortus	venustus		CAVE4	1350	BUTTERFLY TULIP	Liliaceae	H	1000 8000	GO	NP
Calycadenia	truncata		CATR4	1126	ROBIN WEED	Asteraceae	H	0 3800 C	O	NA
Calystegia	malacophylla		CAMA	885	WOOLLY MORNING-GLORY	Convolvulaceae	H	0 2000 C		NP
Calystegia	purpurata		CAPU3	885	BRUSH MORNING-GLORY	Convolvulaceae	H	0 1000 C		S NP
Calystegia	subcaulis		CASU6	885	SHORT-STEM MORNING-GLORY	Convolvulaceae	H	0 1500	O S	NP
Campanula	exigua		CAEX4	1062	RATTAN BEDFLOWER	Campanulaceae	H	2000 4000 C		NA
Campanula	prenanthoides		CAPR6	1063	CALIFORNIA HAREBELL	Campanulaceae	H	0 6000 E	R	NP
Capsella	bursa-pastoris		CABU3	247	SHEPHERD'S PURSE	Brassicaceae	H	0 7000 CE	GO S	IA
Cardamine	oligosperma		CAOL	242	HILL CRESS	Brassicaceae	H	0 3000 C	O S	NA
Carduus	pycnocephalus		CAPY2	1280	ITALIAN THISTLE	Asteraceae	H	0 4001 CE	GO S	IA

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Carduus	tenuiflorus		CATE4	1281	SLENDER THISTLE	Asteraceae	H	0	4001	CE GO S IA
Castilleja	affinis		CAAF	671	INDIAN PAINT BRUSH	Scrophulariaceae	H	0	7001	CE O S NF
Castilleja	foliolosa		CAFO2	671	WOOLLY PAINTED CUP	Scrophulariaceae	H	0	5000	CE GO S NF
Caucalis	microcarpa		CAMI6	1007	BUR-PARSLEY	Apiaceae	H	0	5000	CE ORS NA
Centaurea	calcuttrapa		CECA1	1283	PURPLE STAR THISTLE	Asteraceae	H	0	4001	E GO S IAB
Centaurea	melitensis		CEME1	1283	NAPA THISTLE	Asteraceae	H	0	5001	CE GO S IA
Centaurea	solstitialis		CESO1	1283	YELLOW STAR THISTLE	Asteraceae	H	0	5001	CE GO S IA
Centaureum	floribundum		CEFL1	439	JUNE CENTAURY	Gentianaceae	H	0	1600	GO W NA
Cerastium	viscosum		CEVI	277	HOUSE-EAR CHICKWEED	Caryophyllaceae	H	0	4001	CE GO S IA
Chaetopappa	alsinoides		CHAL2	1172		Asteraceae	H	0	1000	G S NA
Chaetopappa	exilis		CHEX	1172		Asteraceae	H	100	1500	GO NA
Chenopodium	album		CHAL3	372	WHITE PIGWEED	Chenopodiaceae	H	0	6000	CE GORS IA
Chenopodium	californicum		CHCA2	370	CALIFORNIA SOAP PLANT	Chenopodiaceae	H	0	5000	C GO NF
Chlorogalum	pomeridianum		CHPO1	1329	SOAP ROOT	Liliaceae	H	0	5000	GO S NF
Chorizanthe	membranacea		CHME1	325	MEMBRANOUS CHORIZANTHE	Polygonaceae	H	0	4500	C GO NA
Chorizanthe	uniaristata		CHUN	328		Polygonaceae	H	0	4000	C GO NA
Chrysopsis	villosa	echioides	CHVIE	1169	HAIRY GOLDEN ASTER	Asteraceae	H	0	2000	GO S NF
Cirsium	brevieri		CIBR2	1278	SWAMP THISTLE	Asteraceae	H	0	5000	W NB
Cirsium	californicum		CICA1	1280	CALIFORNIA THISTLE	Asteraceae	H	0	7000	C O S NB
Cirsium	proteanum		CIPR	1166	VENUS THISTLE	Asteraceae	H	0	10000	CE GO S NAB
Cirsium	vulgare		CIVU	1276	BULL THISTLE	Asteraceae	H	0	5000	CE GORS IB
Clarkia	biloba		CLBI	941	MULE-EAR CLARKIA	Onagraceae	H	0	4000	GO NA
Clarkia	concinna		CLCO	943	RED RIBBONS	Onagraceae	H	0	4000	E O NA
Clarkia	gracilis		CLGR	938	FAREWELL-TO-SPRING	Onagraceae	H	0	5000	E O NA
Clarkia	purpurea		CLPU	940	WINECUP CLARKIA	Onagraceae	H	0	1000	GO S NA
Clarkia	purpurea	quadrivulnera	CLPUQ	940	FOUR-SPOT CLARKIA	Onagraceae	H	0	6000	CE GO S NA
Clarkia	rubicunda		CLRU	937	RED-BASED GODETIA	Onagraceae	H	0	4001	E O S NA
Clarkia	unguiculata		CLUN1	942	CANYON CLARKIA	Onagraceae	H	0	5000	C GO NA
Clematis	lasiantha		CLLA3	103	OLD MAN'S BEARD	Ranunculaceae	H	0	6000	C O W NF
Clematis	ligusticifolia		CLL2	103	WESTERN VIRGIN'S BOWER	Ranunculaceae	H	0	7000	CE O SW NF
Clintonia	andrewsiana		CLAN	1333	RED-FLOWERING CLINTONIA	Liliaceae	H	0	2000	R NF
Collinsia	bartschiifolia		COBA	1198	WHITE CHINESE HOUSES	Scrophulariaceae	H	0	2000	GO NA
Collinsia	heterophylla		COHE1	644	CHINESE HOUSES	Scrophulariaceae	H	0	2500	CE GO S NA
Collinsia	sparsiflora		COSP	646	FEW-FLOWERED COLLINSIA	Scrophulariaceae	H	0	3000	C GO NA
Collinsia	tinctoria		COTI1	645	IODINE COLLINSIA	Scrophulariaceae	H	2000	7500	C O NA
Conium	maculatum		COMA1	1011	POISON HEMLOCK	Apiaceae	H	0	5000	E GO S IB
Convolvulus	arvensis		COAR2	1193	BINDWEED	Convolvulaceae	H	0	5000	E GO S IP
Conyza	canadensis		COCA2	1224	HORSEWEED	Asteraceae	H	0	4001	CE GORS IA
Cordylanthus	pilosus		COPI2	677	BIRD'S BEAK	Scrophulariaceae	H	0	1000	CE NA
Cotula	coronopifolia		COCO4	1234	BRASS BUTTONS	Asteraceae	H	0	5001	F W IP
Cryptantha	clevelandii		CRCL	574		Boraginaceae	H	0	2500	C S NA
Cryptantha	corollata		CRCO2	569		Boraginaceae	H	0	4500	GO NA
Cryptantha	flaccida		CRFL1	572		Boraginaceae	H	0	6000	CE GO S NA
Cryptantha	intermedia		CRIN4	569	COMMON CRYPTANTHA	Boraginaceae	H	0	6000	C O S NA
Cryptantha	micromeres		CRM12	568		Boraginaceae	H	0	2000	C S NA
Cryptantha	microstachys		CRM13	574		Boraginaceae	H	0	4000	C O NA
Cryptantha	muricata		CRMU2	570		Boraginaceae	H	0	8000	CE GO S NA
Cryptantha	nevadensis	rigida	CRNR	570		Boraginaceae	H	0	6000	C GO S NA
Cryptantha	torreyana	pumila	CRTOF	573		Boraginaceae	H	1500	7500	CE O NA
Cuscuta	subinclusa		CUSU2	467	COMMON DODDER	Cuscutaceae	H	0	5000	CE O S NF
Cynara	cardunculus		CYCA1	1273	CARDUON/ARTICHOKE THISTLE	Asteraceae	H	0	3000	GO IP
Cynoglossum	grande		CYGR	557	HOUD'S TONGUE	Boraginaceae	H	0	5000	E O NF
Cypripedium	humifusa		CYHU2	307		Aizoaceae	H	1001	3001	W NF
Datisca	glomerata		DAGL2	177	DURANGO ROOT	Datisceae	H	0	6500	CE O NF
Daucus	carota		DACA3	1009	WILD CARROT	Apiaceae	H	0	5001	CE GO S IB
Daucus	pustillus		DAPU	1009	RATTLESNAKE WEED	Apiaceae	H	0	5000	CE O S NA
Delphinium	californicum		DECA2	87	COAST LARKSPUR	Ranunculaceae	H	0	2000	E NF
Delphinium	decorum		DEDE1	84	WOODLAND LARKSPUR	Ranunculaceae	H	0	2000	G S NF
Delphinium	hesperium		DEHE	88	WESTERN LARKSPUR	Ranunculaceae	H	0	2500	E GO NF
Delphinium	nudicaule		DENU1	86	RED LARKSPUR	Ranunculaceae	H	0	6500	CE O S NF
Delphinium	variegatum		DEVA	90	ROYAL LARKSPUR	Ranunculaceae	H	0	5001	GO NF
Dentaria	californica		DECA4	243	MILK MAIDS	Brassicaceae	H	0	2500	E ORS NF
Dicentra	chrysantha		DICH	202	GOLDEN EAR-DROPS	Fumariaceae	H	0	5000	C O NF
Dicentra	formosa		DIFO	203	BLEEDING HEART	Fumariaceae	H	0	7000	E OR W NF
Dipsacus	sylvestris		DISY	1057	TEASEL	Dipsacaceae	H	0	2001	GO IB
Disporum	hookeri		DINO2	1332	FAIRY BELLS	Liliaceae	H	0	2000	E R NF
Disporum	smithii		DISM	1332	LARGE-FLOWERED FAIRY BELL	Liliaceae	H	0	2000	E R NF
Dodecatheon	hendersonii		DOHE	401	SHOOTING STAR	Primulaceae	H	0	6700	E GO NF
Dudleya	cymosa		DUCY	722	LIVE-FOREVER	Crassulaceae	H	0	9000	C O NF
Dudleya	cymosa	setchellii	DUCYS	723	LIVE-FOREVER	Crassulaceae	H	0	5000	C O NF
Elatine	californica		ELCA3	273	CALIFORNIA WATER-WORT	Elatinaceae	H	0	5000	W NA
Emmenanthe	penduliflora		EMPE	544	WHISPERING BELLS	Hydrophyllaceae	H	0	5000	C S NF
Epilobium	adenocaulon		EPAD	932	CALIFORNIA COTTONWEED	Onagraceae	H	0	11000	W NF
Epilobium	minutum		EPMI	930	CHAPARRAL COTTONWEED	Onagraceae	H	0	5000	CE O NA
Epilobium	paniculatum		EPPI	929	SUMMER COTTONWEED	Onagraceae	H	0	7500	CE GO S NA
Epipactis	gigantea		EPGI	1399	STREAM ORCHIS	Orchidaceae	H	0	7500	W NF
Eremocarpus	setigerus		ERSE	162	TURKEY MULLAIN	Euphorbiaceae	H	0	2500	GO S NA
Erigeron	foliosus		ERFO	1217	CALIFORNIA FLEABANE	Asteraceae	H	0	5000	C GO NF
Erigeron	petrophilus		ERPE2	1218	INORNATE FLEABANE	Asteraceae	H	1500	7500	CE O NF
Erigeron	philadelphicus		ERPH	1211	SKEVISH	Asteraceae	H	0	4000	G NB
Eriogonum	caninum		ERCA2	345	DOG BUCKWHEAT	Polygonaceae	H	1000	2200	G NA

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Eriogonum	gracile		ERGR3	344		Polygonaceae	H	0 5000	C O S	NA
Eriogonum	inerme		ERIN1	341		Polygonaceae	H	0 7000	C O	NA
Eriogonum	latifolium	nudum	ERLAN	352	TIBINAGUA/NUDE BUCKWHEAT	Polygonaceae	H	0 8000	CE O S	NP
Eriogonum	truncatum		ERTR3	346		Polygonaceae	H	1 1500	C	NA
Eriogonum	umbellatum	stellatum	ERUMS1	344	SULFUR FLOWER	Polygonaceae	H	3000 7500	E GO	NP
Eriophyllum	lanatum	achillaeoides	ERLAA2	1146	OREGON SUNSHINE	Asteraceae	H	0 10000	CE O	NP
Erodium	botrys		ERBO	144	GRAPE STORK'S BILL	Geraniaceae	H	0 4001	CE GORS	IA
Erodium	cicutarium		ERIC12	145	RED-STEM FILAREE	Geraniaceae	H	0 6000	CE GORS	IA
Erodium	macrophyllum		ERMA1	144	LARGE-LEAF FILAREE	Geraniaceae	H	0 3500	GO	NA
Erodium	malacoides		ERMA2	144		Geraniaceae	H	0 4001	C GO	IA
Erodium	moschatum		ERMO4	144	WHITE-STEM FILAREE	Geraniaceae	H	0 4001	CE GORS	IA
Erodium	obtusiplicatum		EROB	144	FILAREE	Geraniaceae	H	0 4001	GO	IA
Eryngium	aristulatum		ERAR5	1033	COYOTE-THISTLE	Apiaceae	H	0 3000		W NP
Eryngium	vaseyi	vallicola	ERVAV	1033	MINERS' ERYNGO	Apiaceae	H	0 1800	G W	NP
Erysimum	capitatum		ERCA3	268	WESTERN WALL FLOWER	Brassicaceae	H	0 8000	CE GO	NE
Eschscholzia	californica	crocea	ESCAC	198	CALIFORNIA POPPY	Papaveraceae	H	0 6500	CE GO	NP
Eucrypta	chrysanthemifolia		EUCH	519	COAST ELLISIA	Hydrophyllaceae	H	0 3000	C O S	NA
Euphorbia	crenulata		EUCR	168	WESTERN WOOD SPURGE	Euphorbiaceae	H	0 5000	CE GORS	NA
Euphorbia	ocellata		EUOC2	169	CANTUA SPURGE	Euphorbiaceae	H	0 1500	GO S	NA
Euphorbia	serpyllifolia		EUSE1	171	THYME-LEAF SPURGE	Euphorbiaceae	H	0 7000	CE GO S	NA
Euphorbia	spathulata		EUSP	168	WART SPURGE	Euphorbiaceae	H	0 4000	CE GO S	NA
Evax	sparsiflora		EVSP	1266	DWARF EVAX	Asteraceae	H	0 2500	CE GO S	NA
Filago	californica		FICA2	1264	CALIFORNIA COTTON ROSE	Asteraceae	H	0 3500	C GO S	NA
Filago	gallica		FIGA	1264	COTTON-ROSE	Asteraceae	H	0 5001	CE GO S	IA
Foeniculum	vulgare		FOVU	1016	SWEET FENNEL	Apiaceae	H	0 4001	CE GO S	IP
Fragaria	californica		FRCA1	776	WOOD STRAWBERRY	Rosaceae	H	0 7000	CE R	NP
Fragaria	chiloensis		FRCH1	776	BEACH STRAWBERRY	Rosaceae	H	0 7000	S	NP
Fritillaria	lanceolata		FRLA1	1341	CHECKER LILY	Liliaceae	H	0 2500	CE O S	NP
Fritillaria	liliacea		FRLI	1339		Liliaceae	H	0 3001	RS	NP
Galium	andrewsii		GAAN1	1041	NEEDLE BEDSTRAW	Rubiaceae	H	1000 6500	C O	NP
Galium	aparine		GAAP	1040	GOOSE GRASS or CLEAVERS	Rubiaceae	H	0 7500	CE GORS	IA
Galium	californicum		GACA1	1042	CALIFORNIA GALIUM	Rubiaceae	H	0 3500	E RS	NP
Galium	murale		GAMU1	1041	MATTED GALIUM	Rubiaceae	H	0 3001	GO	IA
Galium	nuttallii		GANU2	1042	NUTTALL GALIUM	Rubiaceae	H	0 3000	CE O S	NP
Geranium	carolinianum		GECA4	141	CAROLINA GERANIUM	Geraniaceae	H	0 5000	CE GORS	NA
Geranium	dissectum		GEDI1	141	CUT-LEAF GERANIUM	Geraniaceae	H	0 3000	CE GORS	IA
Geranium	molle		GEMO	142	HAIRY GERANIUM	Geraniaceae	H	0 3001	CE GORS	IA
Gilia	achilleaefolia		GIAC	482	BLUE GILIA	Polemoniaceae	H	0 4000	CE O S	NA
Gilia	achilleaefolia	multicaulis	GIACH	482	BLUE GILIA	Polemoniaceae	H	0 4000	E GO S	NA
Gilia	capitata		GICA4	480	GLOBE GILIA	Polemoniaceae	H	0 6000	E	NA
Gilia	clivorum		GICL	483		Polemoniaceae	H	0 4001	E GO	NA
Gilia	millifoliata		GIMI2	483		Polemoniaceae	H	0 3800	G	NA
Gilia	tricolor		GITR2	482	BIRD'S-EYE GILIA	Polemoniaceae	H	0 2000	GO	NA
Githopsis	specularioides		GISP2	1065		Asteraceae	H	0 4000	CE GO S	NA
Glycyrrhiza	lepidota		GLLE3	888	WILD LICORICE	Fabaceae	H	0 7500	CE GO S	NP
Gnaphalium	californicum		GNCA	1260	CALIFORNIA EVERLASTING	Asteraceae	H	0 4000	CE O S	NP
Gnaphalium	chilense		GNCH	1260	COTTON-BATTING PLANT	Asteraceae	H	0 6000	E RS	NA
Gnaphalium	palustre		GNPA	1260	LOWLAND CUDWEED	Asteraceae	H	0 9500		W NA
Gnaphalium	purpureum		GNPU	1259	PURPLE CUDWEED	Asteraceae	H	0 4001	CE GORS	NA
Gnaphalium	ramosissimum		GNRA	1260	PINK EVERLASTING	Asteraceae	H	0 1500	CE	S NB
Grindelia	camporum		GRCA	1166	GUM PLANT	Asteraceae	H	0 4001	GO	NP
Grindelia	hirsutula		GRHI	1164	HAIRY GRINDELIA	Asteraceae	H	0 4001	O S	NP
Habenaria	elegans		HAEL	1396	REIN-ORCHIS	Orchidaceae	H	0 8000	C O	NP
Hedyscopia	cretica		HECR	1302		Asteraceae	H	0 5001	CE GO S	IA
Helenium	puberulum		HEPU1	1139	ROSILLA	Asteraceae	H	0 2000		W NB
Helianthella	castanea		HECA5	1091	MOUNT DIABLO SUNFLOWER	Asteraceae	H	500 4000	GO	NP
Helianthus	annuus	lenticularis	HEANL	1088	COMMON SUNFLOWER	Asteraceae	H	0 5000	CE GO S	NP
Helianthus	californicus		HECA1	1089	CALIFORNIA SUNFLOWER	Asteraceae	H	0 1500		W NP
Heliotropium	curassavicum	oculatum	HECUO	554	SALT HELIOTROPE	Boraginaceae	H	0 6700	GO S	NP
Hemizonia	congesta		HECO2	1123	HAYFIELD TARWEED	Asteraceae	H	0 3001	G	NA
Hemizonia	fitchii		HEFI	1122	FITCH SPIDERWEED	Asteraceae	H	0 3000	GO	NP
Hemizonia	lutescens		HELU1	1123	SONOMA TARWEED	Asteraceae	H	0 3001	G	NA
Hemizonia	luzulaefolia		HELU2	1123	TAR-WEED	Asteraceae	H	0 1000	G	NP
Hemizonia	pungens		HEPU2	1121	COMMON SPIKEWEED	Asteraceae	H	0 1000	G	NA
Heraclium	lanatum		HELA2	1026	COW PARSNIP	Apiaceae	H	0 9000	E ORS	NP
Hesperocnide	tenella		HETE1	921	CREEPING NETTLE	Urticaceae	H	0 4001	CE O S	NA
Heterocodon	rariflorum		HERA2	1064		Campanulaceae	H	0 7500	E GO W	NA
Heuchera	micrantha		HEMI4	741	CREVICE ALUM-ROOT	Saxifragaceae	H	0 2000	E	RSW NP
Hieracium	albiflorum		HIAL	1305	WHITE HAWKWEED	Asteraceae	H	0 9700	R	NP
Holocarpa	heermannii		HOHE	1125	HEERMANN TARWEED	Asteraceae	H	0 4000	GO	NA
Holocarpa	virgata		HOVI	1124	STICKY TARWEED	Asteraceae	H	0 2500	GO	NA
Horkelia	californica		HOCA2	761	CALIFORNIA HONEYDEW	Rosaceae	H	0 3501	G S	NP
Horkelia	frondosa		BOFR	761	LEAFY HONEY-DEW	Rosaceae	H	0 1000	CE	NP
Hydrophyllum	occidentale		HYOC	517	SQUAW LETTUCE	Hydrophyllaceae	H	2500 8000	O S	NP
Hypericum	formosum	scouleri	HYPOS	192	ST. JOHN'S WORT	Hypericaceae	H	0 5000	CE RS	NP
Hypochoeris	glabra		HYGL	1302	SMOOTH CAT'S-EAR	Asteraceae	H	0 5001	CE GORS	IA
Hypochoeris	radicata		HYRA2	1302	HAIRY CAT'S-EAR	Asteraceae	H	0 5001	CE GORS	IP
Iris	douglasiana		IRDO	1391	DOUGLAS IRIS	Iridaceae	H	0 1500	E G W	NP
Iris	macrospilon		IRMA	1390	IRIS	Iridaceae	H	0 3000	E GO S	NP
Lactuca	saligna		LASA	1304		Asteraceae	H	0 4001	CE GORS	IA
Lactuca	serriola		LASE1	1304	PRICKLY LETTUCE	Asteraceae	H	0 5001	CE GORS	IA

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Lactuca	virosa		LAVI1	1304	TALL LETTUCE	Asteraceae	H	0 4001	CE G S	IB
Lagophylla	ramosissima		LARA	1108	SLENDER RABBIT-LEAF	Asteraceae	H	0 5200	CE GORS	NA
Lamium	amplexicaule		LAAM	698	CLASPING HENBIT	Lamiaceae	H	0 5001	GO S	IAB
Lasthenia	chrysostoma		LACH3	1152	GOLD FIELDS	Asteraceae	H	0 3000	C GO S	NA
Lasthenia	glaberrima		LAGL2	1143		Asteraceae	H	0 1000	GO SW	NA
Lasthenia	glabrata		LAGL3	1143		Asteraceae	H	0 4500	GO S	NA
Lasthenia	microglossa		LAMI2	1152		Asteraceae	H	200 3200	C GO	NA
Lathyrus	latifolius		LALA3	891	EVERLASTING PEA	Fabaceae	H	0 5001	E GO	IP
Lathyrus	vestitus		LAVE	892	HILLSIDE PEA	Fabaceae	H	0 4000	E RS	NP
Lathyrus	vestitus	bolanderi	LAVEB	892	HILLSIDE PEA	Fabaceae	H	0 4000	E RS	NP
Layia	gaillardicoides		LAGA	1112		Asteraceae	H	0 3800	GO S	NA
Layia	glandulosa		LAGL4	1111		Asteraceae	H	0 7800	E GO S	NA
Layia	hieracioides		LAMI2	1112		Asteraceae	H	0 2800	E GO	NA
Layia	platyglossa	campestris	LAPLC	1111	TIDY TIPS	Asteraceae	H	0 4000	E GO S	NA
Lemna	gibba		LEGI	1359	DUCKWEED	Lemnaceae	H	0 7000		W NP
Lemna	minima		LEMI1	1359	LEAST DUCKWEED	Lemnaceae	H	0 5000		W NP
Lemna	minor		LEMI2	1359	LESSER DUCKWEED	Lemnaceae	H	0 3500		W NP
Lemna	valdiviana		LEVA	1359	PALE DUCKWEED	Lemnaceae	H	0 7000		W NP
Lepidium	latipes		LELA3	229	DWARF PEPPER-GRASS	Brassicaceae	H	0 2000	G W	NA
Lepidium	nitidum		LENI	228	COMMON PEPPER-GRASS	Brassicaceae	H	0 3000	C G S	NA
Lepidium	pinnatifidum		LEPI	227	PEPPER-GRASS	Brassicaceae	H	0 5001	G	IAB
Lepidium	strictum		LEST	227	WAYSIDE PEPPER-GRASS	Brassicaceae	H	0 5001	CE GO S	IA
Lesningia	germanorum	glandulifera	LEGE	1222		Asteraceae	H	0 5500	GO S	NA
Lewisia	rediviva		LERE	298	BITTER ROOT	Portulacaceae	H	2500 6000	E O S	NF
Lilium	pardalinum		LIPA1	1344	TIGER LILY	Liliaceae	H	0 6000		W NP
Linantus	ambiguus		LIAM	510		Polemoniaceae	H	C 2800	C GO	NA
Linantus	androsaceus		LIAN1	514		Polemoniaceae	H	0 3500	C GO	NA
Linantus	bakeri		LIBA2	510		Polemoniaceae	H	0 3000	E O	NA
Linantus	bicolor		LIBI1	515		Polemoniaceae	H	0 5000	C GO	NA
Linantus	bolanderi		LIBO2	510		Polemoniaceae	H	0 4000	C O	NA
Linantus	ciliatus		LICI	513		Polemoniaceae	H	0 8000	CE GO S	NA
Linantus	dicotomus		LIDI2	510	EVENING SNOW	Polemoniaceae	H	0 5000	C GO S	NA
Linantus	pygmaeus		LIPY	509		Polemoniaceae	H	0 5000	C	NA
Linaria	canadensis	texana	LICAT	653	TOAD FLAX	Scrophulariaceae	H	0 2000	CE GO S	NAB
Linum	breveri		LIBR2	154	BREWER FLAX	Linaceae	H	100 3300	C GO	NA
Linum	californicum		LICA3	154	CALIFORNIA FLAX	Linaceae	H	0 2000	C GO	NA
Linum	micranthum		LIMI	155	LITTLE WHITE FLAX	Linaceae	H	1000 5500	C GO	NA
Lithophragma	affine		LIAF	1108	WOODLAND STAR	Saxifragaceae	H	0 3500	CE GO S	NP
Lithophragma	cymbalaria		LICY	1108	MISSION STAR	Saxifragaceae	H	0 3000	O	NP
Lithophragma	heterophylla		LIHE	737	HILL STAR	Saxifragaceae	H	0 6500	CE GO S	NP
Lomatium	californicum		LOCA1	1026	CHU-CHU-PATE	Apiaceae	H	0 5500	C O	NP
Lomatium	caruifolium		LOCA3	1023	ALKALI PARSNIP	Apiaceae	H	0 4000	E GO	NP
Lomatium	dasyacarpum		LODA1	1024	LACE PARSNIP	Apiaceae	H	0 5000	CE GO S	NP
Lomatium	macrocarpum		LOMA3	1024	SHEEP PARSNIP	Apiaceae	H	0 8000	O	NP
Lomatium	nudicaule		LONU1	1026	PESTLE PARSNIP	Apiaceae	H	0 7000	C	NP
Lomatium	utriculatum		LOUT1	1022	BLADDER PARSNIP	Apiaceae	H	0 5000	GO	NP
Lotus	corniculatus		LOCO2	850	BIRD'S-FOOT TREFOIL	Fabaceae	H	0 5001	CE GO S	IP
Lotus	crassifolius		LOCR	844	BUCK LOTUS	Fabaceae	H	2000 8000	O	NP
Lotus	humistratus		LOHU2	847	COLCHITA	Fabaceae	H	0 6000	CE GO S	NA
Lotus	micranthus		LOMI	847	HILL LOTUS	Fabaceae	H	0 5000	CE GO S	NA
Lotus	purshianus		LOPU2	847	SPANISH CLOVER	Fabaceae	H	0 7000	CE GO S	NA
Lotus	scoparius		LOSC	849	DEER WEED	Fabaceae	H	0 5000	C	S NF
Lotus	strigosus		LOST3	846	BISHOP'S LOTUS	Fabaceae	H	0 5000	CE GO S	NP
Lotus	subpinnatus		LOSU2	846	CALF LOTUS	Fabaceae	H	0 2500	CE GO S	NA
Lupinus	bicolor		LUBI	816	DOVE LUPINE	Fabaceae	H	0 3000	CE GO S	NA
Lupinus	bicolor	microphyllus	LUBIM2	816	DOVE LUPINE	Fabaceae	H	0 5000	CE GO S	NA
Lupinus	bicolor	tridentatus	LUBIT1	816	DOVE LUPINE	Fabaceae	H	0 5001	CE GO S	NA
Lupinus	bicolor	umbellatus	LUBIU	816	DOVE LUPINE	Fabaceae	H	0 4001	CE GO S	NA
Lupinus	densiflorus		LUDE	810	WHITE or PURPLE LUPINE	Fabaceae	H	0 2000	CE GO S	NA
Lupinus	formosus		LUFO	827	SUMMER LUPINE	Fabaceae	H	0 2500	CE GO S	NP
Lupinus	luteolus		LULU1	811	BUTTER LUPINE	Fabaceae	H	0 6000	O	NA
Lupinus	nanus	latifolius	LUNAL	814	DOUGLAS' ANNUAL LUPINE	Fabaceae	H	0 2000	G S	NA
Lupinus	pachylobus		LUPA2	815	MT. DIABLO ANNUAL LUPINE	Fabaceae	H	0 2000	GO	NA
Lupinus	polycarpus		LUPO2	1115	SMALL-SPIKE LUPINE	Fabaceae	H	0 5000	E O	NA
Lupinus	subvexus		LUSU3	809	CHICK LUPINE	Fabaceae	H	0 2500	GO	NA
Lupinus	succulentus		LUSU4	813	ARROYO LUPINE	Fabaceae	H	0 2000	GO	NA
Lythrum	californicum		LYCA1	923	CALIFORNIA LOOSE-STRIPE	Lythraceae	H	0 6000		W NF
Lythrum	hyssopifolia		LYHY	923	GRASS POLY	Lythraceae	H	0 5000		W NAF
Madia	elegans		MAEL	1115	COMMON MADIA	Asteraceae	H	3000 8000	C GO	NA
Madia	exigua		MAEX1	1117		Asteraceae	H	0 3000	CE GO S	NA
Madia	gracilis		MAGR1	1116	GUM-WEED	Asteraceae	H	0 7800	CE GO S	NA
Madia	madrioides		MAMA1	1114	WOODLAND TARWEED	Asteraceae	H	0 4000	E	W NF
Madia	sativa		MASA1	1116	COAST TARWEED	Asteraceae	H	0 1000	CE GO S	IA
Malacothrix	clevelandii		MACL1	1298		Asteraceae	H	0 5000	C O S	NA
Malacothrix	floccifera		MAFL	1298	WOOLLY-TUFT MALACOTHRIX	Asteraceae	H	0 5000	E O S	NA
Malva	neglecta		MANE	129	CHEESE-WEED	Malvaceae	H	0 5001	E GO S	IAB
Malva	niccaensis		MANI1	129	BULL MALLOW	Malvaceae	H	0 5001	CE GO S	IA
Malva	parviflora		MAFA1	129	CHEESE-WEED	Malvaceae	H	0 5001	E GO S	IA
Marah	fabaceus		MAFA1	1059	VALLEY MAN-ROOT	Cucurbitaceae	H	0 2500	E GO S	NP
Marah	fabaceus	agrestis	MAFAA	1059	VALLEY MAN-ROOT	Cucurbitaceae	H	0 5000	CE O S	NF
Marah	oreganus		MAORI	1059	WILD CUCUMBER	Cucurbitaceae	H	0 6000	E RS	NF

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Marrubium	vulgare		MAVU	695	COMMON HOREHOUND	Lamiaceae	H	0 9000	CE GO S	IP
Matricaria	matricarioides		MAMA3	233	PINEAPPLE WEED	Asteraceae	H	0 9000	CE GO S	NA
Medicago	polymorpha	brevispina	MEPO	s116	BUR CLOVER	Fabaceae	H	0 9000	CE GO S	IA
Medicago	polymorpha		MEPOB	s116	SMOOTH BUR CLOVER	Fabaceae	H	0 9000	CE GO S	IA
Medicago	sativa		MESA	831	ALFALFA	Fabaceae	H	0 5001	GO	IP
Melilotus	albus		MEAL1	832	WHITE SWEET-CLOVER	Fabaceae	H	0 6001	CE GO S	IAB
Melilotus	indicus		MEIN1	832	YELLOW MELILOT	Fabaceae	H	0 9000	CE GO S	IAB
Melilotus	officinalis		MEOF1	832	YELLOW SWEET-CLOVER	Fabaceae	H	0 6001	CE GO S	IAB
Mentha	piperita		MEPI	718	PEPPERMINT	Lamiaceae	H	0 2000		W IP
Mentha	pulegium		MEPU1	717	PENNYROYAL	Lamiaceae	H	0 3000	GO	W IP
Mentha	spicata		MESP2	718	SPERMINT	Lamiaceae	H	0 5000		W IP
Mentzelia	dispersa		MEDI	181	NADA STICK-LEAF	Loasaceae	H	0 6500	CE GO S	NA
Mentzelia	micrantha		MEMR2	181	SAN LUIS STICK-LEAF	Loasaceae	H	0 5000	C	NA
Microcala	quadrangularis		MIQU	438		Gentianaceae	H	0 1000	GO	NA
Micropus	californicus		MICA1	1265		Asteraceae	H	0 5000	CE GO S	NA
Microseris	campestris		MICA2	1291		Asteraceae	H	0 7001	G	NA
Microseris	douglasii		MIDO1	1291	SILVER PUFFS	Asteraceae	H	0 9000	GO	NA
Microseris	elegans		MIEL	1291	WODDING MICROSERIS	Asteraceae	H	0 9000	GO	NA
Microseris	linearifolia		MILT2	s168	UROAPPUS	Asteraceae	H	0 6000	GO S	NA
Microseris	sylvatica		MISY	1290	SYLVAN SCORZONELLA	Asteraceae	H	0 4500	GO	NA
Microseris	gracilis		MIGR1	477	ANNUAL PHLOX	Polemoniaceae	H	0 10000	CE GO S	NA
Mimulus	cardinalis		MICA3	610	RED MONKEY-FLOWER	Scrophulariaceae	H	0 8000		W NP
Mimulus	douglasii		MIDO2	621	DOUGLAS MONKEY-FLOWER	Scrophulariaceae	H	0 4000	CE GO SW	NA
Mimulus	fremontii		MIFR1	619	FREMONT MONKEY-FLOWER	Scrophulariaceae	H	0 7000	C O	NA
Mimulus	guttatus		MIGU	616	COMMON MONKEY-FLOWER	Scrophulariaceae	H	0 10000		W NP
Mimulus	latidens		MILA3	614		Scrophulariaceae	H	0 2500	GO	NA
Mimulus	nasutus		MINA2	616	SROUTED MONKEY-FLOWER	Scrophulariaceae	H	0 7500		W NA
Mimulus	rattanii		MIRA	620	RATTAN MONKEY-FLOWER	Scrophulariaceae	H	0 3500	C	NA
Monardella	douglasii		MODO	716	PERFORATED MONARDELLA	Lamiaceae	H	0 3500		O NA
Monardella	villosa		MOV11	712	COYOTE MINT	Lamiaceae	H	0 3000	E	S NP
Monolopia	gracilens		MGR1	1145	SMALL-FLOWERED MONOLOPIA	Asteraceae	H	500 3800	CE R	NA
Monolopia	major		MOMA2	1145	LARGE-FLOWERED MONOLOPIA	Asteraceae	H	1000 1500	G	NA
Montia	gypsophiloides		MOGY	304	ROCK MONTIA	Portulacaceae	H	0 4000	C O W	NA
Montia	perfoliata		MOPE2	302	MINER'S LETTUCE	Portulacaceae	H	0 5000	CE GORS	NA
Montia	spatulata	exigua	MOSP2	303	PALE MONTIA	Portulacaceae	H	0 2500	CE O	NA
Montia	spatulata		MOSPE	304		Portulacaceae	H	0 5500	C O	NA
Montia	verna		MOVE2	302	WATER CHICKWEED	Portulacaceae	H	0 5000		W NA
Muilla	maritima		MUMA	1379	MUILLA	Amaryllidaceae	H	0 7500	E GO S	NP
Myosotis	sylvatica		MYSY	558	COMMON FORGET-ME-NOT	Boraginaceae	H	0 4001	E	IP
Navarretia	mellita		NAME	505	HONEY-SCENTED NAVARRETIA	Polemoniaceae	H	0 3500	CE O	NA
Navarretia	pubescens		NAPU2	503		Polemoniaceae	H	0 3500	C O	NA
Navarretia	squarrosa		NASQ	505	SKUNKWEED	Polemoniaceae	H	0 2500	E O	NA
Nemophila	heterophylla		NEHE	522	WHITE NEMOPHILA	Hydrophyllaceae	H	0 5000	C O S	NA
Nemophila	menziesii		NEME	520	BABY BLUE-EYES	Hydrophyllaceae	H	0 5000	C GO S	NA
Nemophila	pedunculata		NEPE	521	SPREADING NEMOPHILA	Hydrophyllaceae	H	0 7500	CE GORSW	NA
Nicotiana	attenuata		NIAT	602	COYOTE TOBACCO	Solanaceae	H	0 8500	GO S	NA
Nicotiana	bigelovii		NIBI	602	INDIAN TOBACCO	Solanaceae	H	0 3500	CE GO S	NA
Oenothera	graciliflora		OEGR	951		Onagraceae	H	0 3500	GO	NA
Oenothera	hookeri	jonesii	OEOH	946	HOOKE EVENING PRIMROSE	Onagraceae	H	0 3500	E RSW	NP
Oenothera	micrantha		OEM11	955	SMALL PRIMROSE	Onagraceae	H	0 3000	CE G S	NA
Oenothera	micrantha		OEM1J	955	CHAPARRAL SUN-CUP	Onagraceae	H	0 3000	CE S	NA
Oenothera	ovata		OEOV	951	SUN-CUPS	Onagraceae	H	0 3500	E G S	NP
Orobanche	bulbosa		ORBU	683	TUBEROUS BROOM-RAPE	Orobanchaceae	H	0 5000	C	NP
Orobanche	californica		ORCA2	684		Orobanchaceae	H	0 5000	CE GO SW	NP
Orobanche	fasciculata		ORFA2	683	COMMON BROOM-RAPE	Orobanchaceae	H	0 4000	C	NP
Orobanche	uniflora		ORUN	682	NAKED BROOM-RAPE	Orobanchaceae	H	0 7000	C	S NP
Orthocarpus	attenuatus		ORAT	663	VALLEY TASSELS	Scrophulariaceae	H	0 5000	CE GO	NA
Orthocarpus	densiflorus		ORDE	662	OWL'S CLOVER	Scrophulariaceae	H	0 2500	E GO S	NA
Orthocarpus	erianthus		ORER	664	JOHNNY-TUCK	Scrophulariaceae	H	0 4000	GO	NA
Orthocarpus	lithospermoides		ORLI2	661	CREAM SACKS	Scrophulariaceae	H	0 3000	CE GO	NA
Orthocarpus	purpurascens		ORPU1	662	PURPLE OWL'S CLOVER	Scrophulariaceae	H	0 3000	GO S	NA
Orthocarpus	pusillus		ORPU2	664	DWARF OWL'S CLOVER	Scrophulariaceae	H	0 4000	E GO	NA
Osmorhiza	brachypoda		OSBR	1008	CALIFORNIA CICELY	Apiaceae	H	0 8500	O	NP
Osmorhiza	chilensis		OSCH	1009	MOUNTAIN WOOD-CICELY	Apiaceae	H	0 8000	E R	NP
Oxalis	corniculata		OXCO1	148	CREeping WOOD SORREL	Oxalidaceae	H	0 5001	G	IP
Oxalis	oregana		OXOR1	148	REDWOOD SORREL	Oxalidaceae	H	0 2000	R	NP
Papaver	californicum		PACA2	200	WIND POPPY	Papaveraceae	H	0 2500	C O	NA
Parvisedum	pentandrum		PAPE2	720		Crassulaceae	H	800 2500	C O	NA
Pectocarya	pusilla		PEPU1	556		Boraginaceae	H	0 3000	C O	NA
Pedicularis	densiflora		PEDE1	658	INDIAN WARRIOR	Scrophulariaceae	H	0 6000	C O	NP
Penstemon	corymbosus		PECO4	641	ROCK PENSTEMON	Scrophulariaceae	H	0 5000	E R	NP
Penstemon	heterophyllus		PEHE3	639	VARICOLORED PENSTEMON	Scrophulariaceae	H	0 5500	C O	NP
Perideridia	californica		PECA3	1013		Apiaceae	H	0 3000	O W	NP
Perideridia	gairdneri		PEGA	1013	SQUAW-ROOT	Apiaceae	H	0 11000		W NP
Perideridia	kelloggii		PEKE	1012	DOBIE SPINDLE-ROOT	Apiaceae	H	0 4000	CE GO W	NP
Petasites	palmatus		PEPA6	1253	WESTERN COLT'S FOOT	Asteraceae	H	0 1000	E R	NP
Phacelia	breweri		PHBR3	535	BREWER PHACELIA	Hydrophyllaceae	H	0 4200	C O	NA
Phacelia	ciliata		PHCI2	531	FIELD PHACELIA	Hydrophyllaceae	H	0 5000	GO S	NA
Phacelia	distans		PHDI1	529	WILD HELIOTROPE	Hydrophyllaceae	H	0 7000	CE O S	NA
Phacelia	divaricata		PHDI2	538		Hydrophyllaceae	H	0 4000	CE GO	NA
Phacelia	imbricata		PHIM	532	ROCK PHACELIA	Hydrophyllaceae	H	0 3000	C O	NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Phacelia	memoralis		PHNE2	534	BRISTLY PHACELIA	Hydrophyllaceae	H	0 3000	E ORS	NBP
Phacelia	phacelioides		PHPH	537	DIABLO PHACELIA	Hydrophyllaceae	H	2000 3500	C O	NA
Phacelia	rattana		PHRA3	531		Hydrophyllaceae	H	0 4000	OR W	NA
Phacelia	suaveolens		PHSU	539		Hydrophyllaceae	H	1000 4000	C	NA
Phacelia	tanacetifolia		PHTA	529	TANSY-LEAF PHACELIA	Hydrophyllaceae	H	0 4000	CE GO S	NA
Pholistoma	auritum		PHAU2	518	FIESTA FLOWER	Hydrophyllaceae	H	0 4500	C O S	NA
Pholistoma	membranaceum		PHME	518		Hydrophyllaceae	H	0 3500	C O	NA
Phoradendron	flavescens	macrophyllum	PHFLM	991	LARGE-LEAF MISTLETOE	Loranthaceae	H	0 5001	O W	NP
Phoradendron	flavescens	villosum	PHFLV	991	COMMON OR HAIRY MISTLETOE	Loranthaceae	H	0 5001	CE O SW	NP
Picris	echioides		PIEC	1303	BRISTLY OX-TONGUE	Asteraceae	H	0 5001	E GO S	IAB
Plagiobothrys	acanthocarpus		PLAC	583		Boraginaceae	H	0 2000	C G	NA
Plagiobothrys	bracteatus		PLBR	586	BRACED BORAGE	Boraginaceae	H	0 5000	GO SW	NA
Plagiobothrys	bracteatus		FLBR	586		Boraginaceae	H	0 5000	CE GO SW	NA
Plagiobothrys	fulvus	campestris	PLFUC	580		Boraginaceae	H	0 1500	GO	NA
Plagiobothrys	nothofulvus		PLNO	580	POPCORN FLOWER	Boraginaceae	H	0 2500	GO S	NA
Plagiobothrys	tenellus		PLTE1	581		Boraginaceae	H	0 5000	C O	NA
Plantago	erecta		PLER2	408	CALIFORNIA DWARF PLANTAIN	Plantaginaceae	H	0 2500	C GO S	NA
Plantago	lanceolata		PLLA	408	ENGLISH PLANTAIN	Plantaginaceae	H	0 5001	E GORS	IA
Plantago	major		PLMA1	406	COMMON PLANTAIN	Plantaginaceae	H	0 5001	E GO S	IAP
Platystemon	californicus		PLCA4	193	CREAM CUPS	Papaveraceae	H	0 3000	C GO	NA
Plectritis	ciliosa		PLCI	1056	LONG-SPURRED PLECTRITIS	Valerianaceae	H	0 4000	GO	NA
Plectritis	macrocera		PLMA2	1055	SHORT-SPURRED PLECTRITIS	Valerianaceae	H	0 4000	GO	NA
Pogogyne	serpylloides		POSE2	710		Lamiaceae	H	0 4000	CE O W	NA
Polygala	californica		POCA8	156	CALIFORNIA MILKWORT	Polygalaceae	H	0 3000	C R	NP
Polygonum	amphibium		POAM3	364	WATER PERSICARIA	Polygonaceae	H	0 10000		W NF
Polygonum	aviculare		POAV	362	WIRE GRASS	Polygonaceae	H	0 3001	CZ GO S	NA
Polygonum	coccineum		POCO3	364	SWAMP KNOTWEED	Polygonaceae	H	0 5001		W NP
Potamogeton	crispus		POCR	1317	CURLY PONDWEED	Potamogetonaceae	H	0 5001	F	IP
Potamogeton	illinoensis		POIL	1319	ILLINOIS PONDWEED	Potamogetonaceae	H	0 5000	F	NP
Potamogeton	pectinatus		POPE3	1317	PONDWEED	Potamogetonaceae	H	0 7000	F	NP
Portulaca	oleracea		POOL	296	PURSLANE	Portulacaceae	H	0 5001	GO S	IP
Potentilla	glandulosa		POGL2	774	STICKY CINQUEFOIL	Rosaceae	H	0 8000	CE GO S	NP
Prunella	vulgaris		PRVU	697	SELF-HEAL	Lamiaceae	H	0 5001	E GO	IP
Psilocarphus	tenellus		PSTE	1265	SLENDER WOOLLY-HEADS	Asteraceae	H	0 6000		W NA
Psoralea	californica		PSCA1	850	CALIFORNIA PSORALEA	Fabaceae	H	1500 5500	C O	NP
Psoralea	physodes		PSPH	851	CALIFORNIA TEA	Fabaceae	H	0 7500	CE O S	NP
Pterostegia	drymarioides		PTDR	322	PINK CREEPER	Polygonaceae	H	0 5000	CE O S	NA
Rafinesquia	californica		RACA1	1297	CALIFORNIA CHICORY	Asteraceae	H	0 10000	C S	NA
Ranunculus	aquatilis		RAAQ	101	WATER CROWFOOT/BUTTERCUP	Ranunculaceae	H	0 6000		W NF
Ranunculus	californicus		RACA2	95	CALIFORNIA BUTTERCUP	Ranunculaceae	H	0 3000	E GO SW	NP
Ranunculus	canus		RACA3	95		Ranunculaceae	H	0 1000	GO	NP
Ranunculus	hebecarpus		RAHE	97	DOWNY BUTTERCUP	Ranunculaceae	H	0 3000	C O	NA
Ranunculus	muricatus		RAMU1	97	SPINY-FRUITED BUTTERCUP	Ranunculaceae	H	0 3000		W IA
Ranunculus	repens		RARE	93	CREeping BUTTERCUP	Ranunculaceae	H	0 3001	GO W	IP
Raphanus	sativus		RASA2	238	WILD RADISH	Brassicaceae	H	0 5001	GO	IA
Rigloppappus	leptocladus		RILE	1152	BRISTLE-HEAD	Asteraceae	H	0 5000	CE GO S	NA
Romanzoffia	eukadorfii		ROSU1	550		Hydrophyllaceae	H	0 2500	E R	NP
Rorippa	curvisiliqua		ROCU	239	WESTERN YELLOW CRESS	Brassicaceae	H	0 10000		W NAB
Rorippa	nasturtium-aquaticum		RONA	240	WATER CRESS	Brassicaceae	H	0 8000		W IP
Rubus	vitifolius		RUVI2	783	COAST CALIF. BLACKBERRY	Rosaceae	H	0 4000	E RS	NP
Rumex	acetosella		RUAC	356	SHEEP SORREL	Polygonaceae	H	0 10000	GO	IP
Rumex	conglomeratus		RUCO	358	WHORLED DOCK	Polygonaceae	H	0 4001		W IP
Rumex	crispus		RUCR2	358	CURLY DOCK	Polygonaceae	H	0 7001	E GO S	IP
Rumex	occidentalis		RUOC2	358	WESTERN DOCK	Polygonaceae	H	0 5001	F	W NF
Rumex	pulcher		RUPU	359	FIDDLE DOCK	Polygonaceae	H	0 5001	E GO S	IP
Sagina	occidentalis		SAOC1	277	WESTERN PEARLWORT	Caryophyllaceae	H	0 8000	CE GO S	NA
Salsola	kali	tenuifolia	SAKAT	384	RUSSIAN THISTLE	Chenopodiaceae	H	0 6001	GO	IAP
Salvia	columbariae		SACO1	703	CHIA	Lamiaceae	H	0 4000	C O S	NA
Salvia	spathacea		SASP	704	CRIMSON SAGE	Lamiaceae	H	0 2000	C O S	NP
Sanicula	bipinnata		SABI2	1006	POISON SANICLE	Apiaceae	H	0 5000	GO S	NP
Sanicula	bipinnatifida		SABI3	1005	PURPLE SANICLE	Apiaceae	H	0 6000	C GO	NP
Sanicula	crassicaulis		SACR2	1005	GAMBLE WEED	Apiaceae	H	0 4500	GORS	NP
Sanicula	laciniata		SALA2	1005	COAST SANICLE	Apiaceae	H	0 1000	E	NP
Sanicula	saxatilis		SASA2	1006	DEVIL'S SANICLE	Apiaceae	H	3000 3800	C O	NP
Sanicula	tuberosa		SATU	1006	TURKEY PEA	Apiaceae	H	0 8000	C O	NP
Satureja	douglasii		SADO1	708	YERBA BUENA	Lamiaceae	H	0 3000	CE RS	NP
Saxifraga	californica		SACA2	736	CALIFORNIA SAXIFRAGE	Saxifragaceae	H	0 5000	C O S	NP
Scandix	pecten-veneris		SCPE	1008	SHEPHERD'S NEEDLE	Apiaceae	H	0 5001	CE GO S	IA
Scrophularia	californica		SCCA2	642	CALIFORNIA FIGWORT	Scrophulariaceae	H	0 2000		RSW NP
Scutellaria	tuberosa	similis	SCTUS	694	BLUE SKULL-CAP	Lamiaceae	H	0 5000	C O	NP
Sedum	spathulifolium		SESP2	727	MOSS SEDUM	Crassulaceae	H	0 7500	E R	NP
Senecio	aronicoides		SEAR	1248		Asteraceae	H	0 8000	C	NP
Senecio	brevieri		SEBR	1251	BREWER SENECIO	Asteraceae	H	0 5500	C O	NP
Senecio	sylvaticus		SESY	1252	WOOD GROUNDSEL	Asteraceae	H	0 3001	C GO S	IA
Senecio	vulgaris		SEVU	1252	COMMON GROUNDSEL	Asteraceae	H	0 5001	CE GOR	IA
Sherardia	arvensis		SHAR1	1045	BLUE FIELD MADDER	Rubiaceae	H	0 5001	GO	IA
Sidalcea	malvaeflora		SIMA1	132	CHECKER BLOOM	Malvaceae	H	0 2000	E GO	NP
Silene	antirrhina		SIAN	287	SLEEPY CATCHFLY	Caryophyllaceae	H	0 5000	CE GO S	NA
Silene	californica		SICA2	288	INDIAN PINK	Caryophyllaceae	H	0 5000	CE O S	NP
Silene	gallica		SIGA	288	WINDMILL PINK	Caryophyllaceae	H	0 5001	CE GO S	IA
Silene	verecunda		SIVE	291	COAST PINK	Caryophyllaceae	H	0 4001	S	NP

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Silybum	marianum		SIMA2	1273	MILK THISTLE	Asteraceae	H	0 5001	CE GORS	IAB
Sisymbrium	officinale		SIOF	231	HEDGE MUSTARD	Brassicaceae	H	0 5000	CE GO S	IA
Sisyrinchium	bellum		SIBE	1392	BLUE-EYED GRASS	Iridaceae	H	0 3000	GO	NP
Smilacina	racemosa	amplexicaulis	SMRAA	1331	FAT SOLOMON'S SEAL	Liliaceae	H	0 6000	E R	NP
Smilacina	stellata	sessilifolia	SMSTS	1331	FALSE SOLOMON'S SEAL	Liliaceae	H	0 4001	CE R W	NP
Solanum	nigrum		SONI	597	BLACK NIGHTSHADE	Solanaceae	H	0 5001	GO	IA
Solidago	californica		SOCA2	1185	CALIFORNIA GOLDENROD	Asteraceae	H	200 7500	CE O S	NP
Soliva	sessilis		SOSE	1233		Asteraceae	H	0 3000	E GO S	NA
Sonchus	asper		SOAS	1304	PRICKLY SOW-THISTLE	Asteraceae	H	0 5001	E GORS	IA
Sonchus	oleraceus		SOOL	1303	COMMON SOW-THISTLE	Asteraceae	H	0 5001	E GORS	IA
Spergula	arvensis		SPAR	283	SPURRY	Caryophyllaceae	H	0 5001	GO	IA
Stachys	bullata		STBU	699	CALIFORNIA HEDGE NETTLE	Lamiaceae	H	0 4000	CE RS	NP
Stachys	chamissonis		STCH	699	HEDGE-NETTLE	Lamiaceae	H	0 2200	E RS	NP
Stachys	pycnantha		STPY	700		Lamiaceae	H	0 3500	E O	NP
Stachys	rigida		STRI	700	HEDGE NETTLE	Lamiaceae	H	0 8000	R	NP
Stachys	rigida	quercetorum	STRIQ	700	HEDGE NETTLE	Lamiaceae	H	0 5000	E O S	NP
Stellaria	media		STME	275	COMMON CHICKWEED	Caryophyllaceae	H	0 5001	E ORS	IA
Stellaria	nitens		STNI	275	SHINING CHICKWEED	Caryophyllaceae	H	0 5500	GO	NA
Stephanomeria	virgata		STVI2	1295	THIGGY WREATH PLANT	Asteraceae	H	0 6000	E GO S	NA
Streptanthus	glandulosus	albidus	STGLA	220	JEWEL FLOWER	Brassicaceae	H	0 4000	C O	NA
Streptanthus	hispidus		STHI	221	HAIRY TWISTED-FLOWER	Brassicaceae	H	2000 3850	C	NA
Stylocline	filaginea		STFI	1263		Asteraceae	H	0 5500	C O S	NA
Stylomecon	heterophylla		STHE2	200	WIND POPPY	Papaveraceae	H	0 4000	C GO	NA
Taraxacum	officinale		TAOF	1310	COMMON DANDELION	Asteraceae	H	0 10000	E GORS	IBP
Tauschia	hartwegii		TAHA	101		Apiaceae	H	0 5000	C O	NP
Thalictrum	polycarpum		THPO	107	FOOTHILL MEADOW RUE	Ranunculaceae	H	0 2500	E O S	NP
Thelypodium	flavescens		THFL1	215		Brassicaceae	H	0 2000	G	NA
Thelypodium	lasioophyllum		THLA2	216	CUT-LEAVED THELYPODIUM	Brassicaceae	H	0 5000	GO	NA
Thysanocarpus	curvipes		THCU	254	FRINGE-POD	Brassicaceae	H	0 5000	C GO S	NA
Thysanocarpus	laciniatus		THLA3	254		Brassicaceae	H	0 3500	C GO S	NA
Tillaea	aquatica		TIAQ	719	WATER PYGMY	Crassulaceae	H	0 2000		W NA
Tillaea	erecta		TIER	719	SAND PYGMY	Crassulaceae	H	0 2500	CE O S	NA
Tonella	tenella		TOTE	647		Scrophulariaceae	H	0 3000	C O	NA
Torilis	nodosa		TONO	1007	KNOTTED HEDGE PARSLEY	Apiaceae	H	0 2000	E O	IA
Tragopogon	porrifolius		TRPO1	1301	OYSTER ROOT or SALSIFY	Asteraceae	H	0 5001	GO S	IBP
Tribulus	terrestris		TRTE	159	PUNCTURE-VINE	Eryophyllaceae	H	0 5000	GO S	IA
Trichostema	lanceolatum		TRLA1	693	VINEGAR WEED / BLUE CURLS	Lamiaceae	H	0 3500	C O S	NA
Trientalis	latifolia		TRLA3	404	STARFLOWER	Primulaceae	H	0 4500	E R	NP
Trifolium	albopurpureum		TRAL	838	RANCHERIA CLOVER	Fabaceae	H	0 4000	GO	NA
Trifolium	amplectens	truncatum	TRAMT	841	BLADDER CLOVER	Fabaceae	H	0 2500	GO S	NA
Trifolium	barbigerum		TRBA	839	COLONY CLOVER	Fabaceae	H	0 1501	E GO W	NP
Trifolium	bifidum	decipiens	TRBID	834	PINOLE CLOVER	Fabaceae	H	0 2300	E G	NA
Trifolium	ciliolatum		TRCI	835	TREE CLOVER	Fabaceae	H	0 5000	E GO	NA
Trifolium	dichotomum		TRDI	838		Fabaceae	H	0 3500	E GO	NA
Trifolium	fucatum		TRFU	841	BULL CLOVER	Fabaceae	H	0 3000		W NA
Trifolium	gracilentum		TRGR2	835	PIN-POINT CLOVER	Fabaceae	H	0 5000	C GO	NA
Trifolium	incarnatum		TRIN2	837	CLOVER	Fabaceae	H	0 4001	GO S	IA
Trifolium	microcephalum		TRMI2	839	MAIDEN CLOVER	Fabaceae	H	0 8500	GO	NA
Trifolium	microrodon		TRMI3	839	THIMBLE CLOVER	Fabaceae	H	0 4000	E G	NA
Trifolium	obtusiflorum		TROB2	841	CREEK CLOVER	Fabaceae	H	0 5000		W NA
Trifolium	oliganthum		TROL1	840	LANKY CLOVER	Fabaceae	H	0 3500	E R	NA
Trifolium	olivaceum		TROL2	838		Fabaceae	H	0 1200	GO	NA
Trifolium	olivaceum	columbianum	TROL3	838		Fabaceae	H	0 1200	GO	NA
Trifolium	tridentatum		TRTR2	841	TOMCAT CLOVER	Fabaceae	H	0 5000	GO	NA
Trifolium	variegatum		TRVA	840	WHITE-TIP CLOVER	Fabaceae	H	0 8000		W NA
Trifolium	wormskieldii		TRWO2	840	COW CLOVER	Fabaceae	H	0 10000		W NP
Trillium	chloropetalum		TRCH	1355	TRILLIUM	Liliaceae	H	0 3500	E RS	NP
Trillium	chloropetalum	giganteum	TRCHG	1355	RED TRILLIUM	Liliaceae	H	0 3500	CE	NP
Trillium	ovatum		TROV2	1355	WESTERN WAKE ROBIN	Liliaceae	H	0 4001	E R	NP
Triodanis	biflora		TRBI2	1064		Campanulaceae	H	0 6500	C	NA
Tropidocarpum	capparideum		TRCA2	245	ALKALI POD	Brassicaceae	H	0 3500	GO	NA
Tropidocarpum	gracile		TRGR4	244	WORM SEED MUSTARD	Brassicaceae	H	0 5000		W NP
Urtica	holosericea		URHO	920	CREEK NETTLE	Urticaceae	H	0 9000	E ORSW	NP
Urtica	urens		URUR	921	DWARF NETTLE	Urticaceae	H	0 5001	G	IA
Vancouveria	planipetala		VAPL	112	INSIDE-OUT FLOWER	Berberidaceae	H	100 2000		R NP
Verbena	lasioatachys		VELA	687	VERVAIN	Verbenaceae	H	0 8000	E GO S	NP
Verbena	robusta		VERO	688		Verbenaceae	H	0 5001	E GO S	NP
Veronica	americana		VEAM	656	AMERICAN BROOKLINE	Scrophulariaceae	H	0 10500		R W NP
Veronica	peregrina	salapensis	VEPEX	655	NECKWEED	Scrophulariaceae	H	0 10200		W NA
Veronica	persica		VEPE	656	PERSIAN SPEEDWELL	Scrophulariaceae	H	0 5001	G	IA
Vicia	americana	oregana	VIAMO	895	AMERICAN VETCH	Fabaceae	H	0 5000	E GO S	NP
Vicia	americana	truncata	VIAMT	895	AMERICAN VETCH	Fabaceae	H	0 5000	E GO S	NP
Vicia	angustifolia		VIAN	896	COMMON VETCH	Fabaceae	H	0 5001	E GORS	IA
Vicia	dasycarpa		VIDA	896	WOOLLYPOD VETCH	Fabaceae	H	0 4001	G	IAB
Vicia	exigua		VIEK	895	CALIFORNIA VETCH	Fabaceae	H	0 2000	CE GO S	IA
Vicia	sativa		VISA	896	SPRING VETCH	Fabaceae	H	0 5001	CE GO S	IA
Vinca	major		VIMA1	450	PERIWINKLE	Apocynaceae	H	0 4001	E R	IP
Viola	adunca		VIAD	190	BLUE VIOLET	Violaceae	H	25 8500	E OR W	NP
Viola	pedunculata		VIPE	188	GRASS PANSY	Violaceae	H	0 2500	GO S	NP
Viola	purpurea		VIPU	187	MOUNTAIN VIOLET	Violaceae	H	1800 6000	CE GO S	NP
Viola	quercetorum		VIQU	188	OAK VIOLET	Violaceae	H	0 7000	C O	NP

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Viola	sempervirens		WISE	185	REDWOOD VIOLET	Violaceae	H	0 3500	E R	NP
Viola	sheltonii		VISH	189	FAN VIOLET	Violaceae	H	2500 8000	CE	NP
Wyethia	angustifolia		WYAN	1085	NARROW LEAF MULE-EARS	Asteraceae	H	0 5500	GO	NP
Wyethia	glabra		WYGL	1084	SMOOTH MULE-EARS	Asteraceae	H	0 2700	CE	NP
Wyethia	helenioides		WYHE	1084	WOOLLY MULE-EARS	Asteraceae	H	0 6000	GO	NP
Xanthium	spinulosum		XASP	1105	SPINY CLOMBUR	Asteraceae	H	0 3000	CE GO S	NA
Xanthium	strumarium	canadense	XASTC	1105	COCKLE BUR	Asteraceae	H	0 6001	CE GO S	NA
Zauschneria	californica		ZACA1	926	CALIFORNIA FUCHSIA	Onagraceae	H	0 3500	CE O S	NP
Zigadenus	fremontii		ZIFR	1334	STAR ZYGADENE	Liliaceae	H	0 3500	CE GO	NP

Grasses and Grasslike

Agropyron	trachycaulum		AGTR1	1503	SLENDER WHEATGRASS	Poaceae	G	0 11000	CE G S	NP
Agrostis	stolonifera	major	AGSTM	s192	REDTOP	Poaceae	G	0 7500		W IP
Agrostis	exarata		AGEX1	1522	SPIKE REDTOP	Poaceae	H	0 10000	CE GO SW	NP
Agrostis	semiverticillata		AGSE	1520	WATER BENT	Poaceae	G	0 5001	G W	IP
Aira	caryophylla		AICA	1514	SILVER HAIRGRASS	Poaceae	G	0 5000	CE GO S	IA
Alopecurus	pratensis		ALPR1	1523	MEADOW FOXTAIL	Poaceae	G	0 3001	F W	IP
Avena	barbata		AVBA	1514	SLENDER WILD OAT	Poaceae	G	0 5001	CE GO S	IA
Avena	fatua		AVFA	1514	WILD OAT	Poaceae	G	0 5001	CE GO S	IA
Briza	maxima		BRMA1	1491	BIG QUAKING GRASS	Poaceae	G	0 5001	CE GO S	IA
Briza	minor		BRM11	1490	LITTLE QUAKING GRASS	Poaceae	G	0 5001	CE GO S	IA
Bromus	carinatus		BRCA1	1470	CALIFORNIA BROME GRASS	Poaceae	G	0 10000	CE GO S	NAB
Bromus	diandrus		BRDI2	s187	RIPGUT / NEEDLE BROME	Poaceae	G	0 4001	CE GO S	NP
Bromus	laevipes		BRLA1	1471	WOODLAND BROM GRASS	Poaceae	G	0 8600	CE O SW	NP
Bromus	madritensis		BRMA2	1474	SPANISH BROME GRASS	Poaceae	G	0 5001	CE GO S	IA
Bromus	mollis		BRMO2	1473	SOFT BROME OR SOFT CHEAT	Poaceae	G	0 5001	CE GO S	IA
Bromus	racemosus		BRRA	1473	SMOOTH BROME	Poaceae	G	0 5001	CE GO S	IA
Bromus	rubens		BRRU	1474	RED / FOXTAIL BROME	Poaceae	G	0 4001	CE GO S	IA
Bromus	tectorum		BRTE	1474	CHEAT GRASS	Poaceae	G	0 9001	CE GO S	IA
Bromus	trinitii		BRTR	1474	CHILEAN BROME GRASS	Poaceae	G	0 5000	CE GO S	IA
Calamagrostis	rubescens		CARU	1517	PINEGRASS	Poaceae	G	0 2500	CE R	NP
Carex	barbarea		CABA1	1459	SANTA BARBARA SEDGE	Cyperaceae	G	0 3000	E GO	NP
Carex	bolanderi		CABO2	1443	BOLANDER'S SEDGE	Cyperaceae	G	150 8100		W NP
Carex	dudleyi		CADU1	1440	DUDLEY SEDGE	Cyperaceae	G	0 2500	E G	W NP
Carex	globosa		CAGL1	1450	ROUND-FRUITED SEDGE	Cyperaceae	G	0 4200	E ORS	NP
Carex	lanuginosa		CALA3	1455	WOOLLY SEDGE	Cyperaceae	G	0 10750		NP
Carex	serratodens		CASE2	1458	BIFID SEDGE	Cyperaceae	G	0 6000	E GO	W NP
Cortaderia	selloana		COSE1	1496	PAMPAS GRASS	Poaceae	G	0 3001	GO S	IP
Cynodon	dactylon		CYDA	1537	BERMUDA GRASS	Poaceae	G	0 300C	CE GO S	NP
Cynosuroides	echinatus		CYEC	1495	DOGTAIL GRASS	Poaceae	G	0 5001	GO	IA
Cyperus	niger	capitatus	CYNIC	1424	BROWN CYPERUS	Cyperaceae	G	0 3000		W NP
Danthonia	californica		DACA1	1516	CALIFORNIA OATGRASS	Poaceae	G	0 5000	C GO S	NP
Deschampsia	danthonioides		DEDA	1513	ANNUAL HAIRGRASS	Poaceae	G	0 9000	G SW	NA
Distichlis	spicata	nana	DISPN	1494	SALT GRASS	Poaceae	G	0 3001	G	NP
Echinochloa	crusgalli		ECCR	1547	WATER / BARNYARD GRASS	Poaceae	G	0 6001	CE GO SW	IA
Elymus	glauca		ELGL	1505	BLUE WILD-RYE	Poaceae	G	0 7500	CE GO S	NP
Elymus	triticoideus		ELTR	1505	BEARDLESS WILD-RYE	Poaceae	G	0 7500	CE GO S	NP
Equisetum	arvense		EQAR	28	COMMON HORSETAIL	Equisetaceae	G	0 10000	F W	NP
Equisetum	funstoni		EQFU	27	FUNSTON SCOURING-RUSH	Equisetaceae	G	0 8000		W NA
Equisetum	hyemale	robustum	EQHYR	27	GIANT SCOURING-RUSH	Equisetaceae	G	0 8500	CE GORSW	NP
Equisetum	telmateia	braunii	EQTEB	27	GIANT HORSETAIL	Equisetaceae	G	0 4500		W NP
Eragrostis	curvula		ERCU	1493	CREeping LOVEGRASS	Poaceae	G	0 5001	GO	NP
Festuca	californica		FECA	1477	CALIFORNIA FESCUE	Poaceae	G	0 6000	CE GO S	NP
Festuca	confusa		FECC	1476	HAIRY-LEAVED FESCUE	Poaceae	G	0 5000	CE GO S	NA
Festuca	dertonensis		FEDE	1476		Poaceae	G	0 5001	CE GO S	IA
Festuca	eastwoodae		FEEA	1476	EASTWOOD FESCUE	Poaceae	G	0 5001	CE GO S	NA
Festuca	elmeri		FEEL2	1477	ELMER FESCUE	Poaceae	G	0 5000	E O	NP
Festuca	grayi		FEGR	1476	GRAY'S FESCUE	Poaceae	G	0 6000	CE GO S	NA
Festuca	megallura		FEME	1476	FOXTAIL FESCUE	Poaceae	G	0 5500	CE GO S	NA
Festuca	microstachys		FEMI	1476		Poaceae	G	0 5500	CE GO S	NA
Festuca	myuros		FEMY	1476	RAT-TAIL FESCUE	Poaceae	G	0 5500	CE GO S	NA
Festuca	octoflora		FEOC2	1476	SIX-WEEKS FESCUE	Poaceae	G	0 5000	CE GO S	NA
Festuca	pacifica		FEPA	1476	PACIFIC FESCUE	Poaceae	G	0 5000	CE GO S	NA
Festuca	reflexa		FERE	1476	FEW-FLOWERED FESCUE	Poaceae	G	0 5000	CE GO S	NA
Gastridium	ventricosum		GAVE1	1525	NIT-GRASS	Poaceae	G	0 5001	GO S	IA
Heleocharis	montevidensis	parishii	HEMOP	1420	PURPLE SPIKE-RUSH	Cyperaceae	G	0 7000		W NP
Heleocharis	palustris		HEPA2	1421	COMMON SPIKE-RUSH	Cyperaceae	G	0 8000		W NP
Hierochloa	occidentalis		HIOC	1541	VANILLA GRASS	Poaceae	G	0 2000	E R	NP
Holcus	lanatus		HOLA1	1515	VELVET GRASS	Poaceae	G	0 7500	GO	IP
Hordeum	brachyantherum		HOBR	1508	MEADOW BARLEY	Poaceae	G	0 11000	CE GO SW	NP
Hordeum	geniculatum		HOGC	s190	MEDITERRANEAN BARLEY	Poaceae	G	0 6001	CE GO S	IA
Hordeum	leporinum		HOLE	1509	FOXTAIL BARLEY	Poaceae	G	0 5001	CE GOR	IA
Isocetes	howellii		ISHO	26	HOWELL QUILLWORT	Isocetaceae	G	0 9000		W NP
Juncus	balticus		JUBA	1405	WIRE RUSH	Juncaceae	G	0 9000		W NP
Juncus	bufonius		JUBU	1405	TOAD RUSH	Juncaceae	G	0 8000		W NA
Juncus	effusus	pacificus	JUEFP	1404	BOG RUSH	Juncaceae	G	0 8000		W NP
Juncus	mexicanus		JUMEX3	1404	MEXICAN RUSH	Juncaceae	G	0 11000		W NP
Juncus	patens		JUPA2	1404	SPREADING RUSH	Juncaceae	G	0 5000		W NP
Juncus	xiphioides		JUXI	1411	IRIS-LEAVED RUSH	Juncaceae	G	0 7000		W NP

Genus	Species	Variety	Vegcode	Munz	Common Name	Family	Strata	E-Range	Vegtype	NI/L
Koeleria	cristata		KOCR	1511	JUNEGRASS	Poaceae	G	0 11500	CE GO S	NP
Lolium	multiflorum		LOMU	1510	ITALIAN RYEGRASS	Poaceae	G	0 4001	CE GO S	IP
Lolium	perenne		LOPE1	1509	PERENNIAL RYEGRASS	Poaceae	G	0 4001	CE GO S	IP
Lolium	temulentum		LOTE	1510	DARNEL	Poaceae	G	0 4000	CE GO S	IA
Luzula	comosa		LUCO1	1413	COMMON WOODRUSH	Juncaceae	G	3000 10500	E	NP
Luzula	subaequalis		LUSU2	1413	FOOTHILL WOOD-RUSH	Juncaceae	G	0 4000	E GO S	NP
Melica	bulbosa		MEBU	1498	ONION-GRASS	Poaceae	G	2900 11000	E G	W NP
Melica	californica		MECA1	1498	CALIFORNIA MELIC	Poaceae	G	0 3000	E GO	NP
Melica	imperfecta		MEIM	1498	SMALL-FLOWERED MELIC	Poaceae	G	0 4000	C O S	NP
Melica	torreyana		METO1	1498	TORREY MELIC	Poaceae	G	0 2500	CE	NP
Phalaris	minor		PHMI1	1542	CANARY GRASS	Poaceae	G	0 5001	CE GO S	IA
Phalaris	tuberosa	stenoptera	PHTUS	1542	HARDING GRASS	Poaceae	G	0 3001	G	W IP
Poa	annua		POAN1	1484	ANNUAL BLUEGRASS	Poaceae	G	0 3000	CE GO S	IA
Poa	bolanderi	howellii	POBOH	1484	HOWELL BLUEGRASS	Poaceae	G	0 2500	O	NA
Poa	scabrella		POSC3	1489	PINE BLUEGRASS	Poaceae	G	0 5000	CE GO S	NP
Polypogon	interruptus		POIN2	1524	DITCH POLYPOGON	Poaceae	G	0 5001	CE GO SW	IP
Polypogon	monspeliensis		POMO1	1524	RABBITFOOT GRASS	Poaceae	G	0 5001	CE GO SW	IA
Scirpus	acutus		SCAC	1418	COMMON TULE	Cyperaceae	G	0 5000	F	W NP
Scirpus	americanus		SCAM	1417	THREE-SQUARE	Cyperaceae	G	0 7000		W NP
Scirpus	microcarpus		SCMI	1416	PANICLED BULRUSH	Cyperaceae	G	0 9000		W NP
Sitanion	hansenii		SIHA1	1506	HANSEN SQUIRRELTAIL	Poaceae	G	0 13000	CE GO S	NP
Sitanion	hystrix		SIHY	1506	SQUIRRELTAIL	Poaceae	G	0 13000	CE GO S	NP
Sitanion	jubatum		SIJU	1506	BIG SQUIRRELTAIL	Poaceae	G	0 10000	CE GO S	NP
Stipa	lepis		STLE2	1532	FOOTHILL NEEDLEGRASS	Poaceae	G	0 4000	C GO S	NP
Stipa	pulchra		STPU	1522	PURPLE NEEDLEGRASS	Poaceae	G	0 5000	C GO S	NP
Typha	domingensis		TYDO	1367	CAT-TAIL	Typhaceae	G	0 5000	F	NP
Typha	latifolia		TYLA	1367	COMMON CAT-TAIL	Typhaceae	G	0 5000	F	NP

Ferns

Adiantum	jordani		ADJO	38	CALIF. MAIDENHAIR FERN	Pteridaceae	F	0 3500	CE	RS NP
Adiantum	pedatum	aleuticum	ADPEA	38	FIVE-FINGER FERN	Pteridaceae	F	0 10500	CE	R NP
Aspidotis	californica		ASCA1	35	CALIFORNIA LACE FERN	Pteridaceae	F	0 2500	E	ORS NP
Cheilanthes	covillei		CHCO2	34	COVILLE LIP-FERN	Pteridaceae	F	1500 9000	C	NP
Cystopteris	fragilis		CYFR	43	BRITTLE or BLADDER FERN	Aspidiaceae	F	0 1000	E	OR W NP
Dryopteris	arguta		DRAR	42	COASTAL WOOD-FERN	Aspidiaceae	F	0 5000	E	ORS NP
Pellaea	andromedaefolia		PEAN1	36	COFFEE FERN	Pteridaceae	F	0 4000	CE	ORS NP
Pellaea	mucronata		PEMU	36	BIRD'S-FOOT FERN	Pteridaceae	F	0 6000	CE	O S NP
Pityrogramma	triangularis		PITR	37	GOLDENBACK FERN	Pteridaceae	F	0 5000	E	ORS NP
Polypodium	californicum		POCA1	45	CALIFORNIA POLYPODY FERN	Polypodiaceae	F	0 4000	CE	RS NP
Polypodium	californicum	kaulfussii	POCAK		KAUFUS' POLYPODY FERN	Polypodiaceae	F	0 4000	CE	RS NP
Polystichum	munitum		POMU1	40	SWORD FERN	Aspidiaceae	F	0 2500	E	R NP
Pteridium	aquilinum	pubescens	PTAQP	31	BRACKEN FERN	Pteridaceae	F	0 10000	CE	GORS NP
Woodwardia	fimbriata		WOFI	44	CHAIN FERN	Blechnaceae	F	0 5000	E	R W NP

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